Children's collaborative technology-mediated storymaking

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Instructional challenges in early childhood education

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In 2004, the University of Gothenburg established the Centre of Educational Science and Teacher Research (CUL). CUL aims to promote and support research and third-cycle studies linked to the teaching profession and the teacher training programme. The graduate school is an interfaculty initiative carried out jointly by the Faculties involved in the teacher training programme at the University of Gothenburg and in cooperation with municipalities, school governing bodies and university colleges.

Foto: Ingrid Skantz Åberg

Denna bok tillägnas mina inspiratörer Elias och Ingrid

Abstract

The overarching purpose of the present thesis is to examine what activities emerge when children in two Swedish preschool classes are instructed to create stories with digital technologies. The area of interest is found in the intersection of instruction and learning. For the present thesis, this entails empirically studying children's storymaking activities with an analytical focus on the interaction between the children, the teacher and the cultural tools used. What motivates the research is the expansive digitalisation that increases children's access to technology and experiences of digital texts from an early age. The development raises questions about how these wider social and cultural changes transform children's literacy activities within the institutional context and what challenges it poses to literacy education. The theory underlying the thesis is a sociocultural perspective grounded in the epistemological view of learning as contingent on social interaction taking place in situated and sensemaking contexts and encompasses available cultural tools. Another premise is that the narrative genre, which often serves as a means for engaging children in their early reading and writing, constitutes an essential mediator for communication and sensemaking. The data material was generated through video observations in two schools involving two preschool teachers and 16 six-year-old children. The films were partly transcribed and analysed according to the principles of Interaction Analysis. Additionally, 15 digitally produced stories were collected. The thesis consists of four empirical studies and an extended summary where the overall findings show what primarily mediates the children's storymaking and contributes to the participants' level of success in establishing sufficient intersubjectivity to perform the task, is the teachers' organisation of the

activities, the introduction, the contingent scaffolding strategies, the design of the selected technologies and the children's common experience of popular culture. The findings show that the children, while practicing the ability to collaboratively negotiate an intelligible story, must simultaneously learn how to operate the digital technologies, which to some extent proves to be demanding and implies a subordination of the narration. At the same time, the activities and certain inherent qualities of the technologies appear to contribute to an aesthetic experience as the children, while narrating, build upon their cultural experience and use their repertoire of semiotic means, such as verbal and written language, images, colours and forms. A noticeable difficulty is the transformation between means, for example from the verbal to the written, or to the visual. These difficulties largely depend on the governed laws of the semiotic means but are also evoked by the teachers' scaffolding and the meaning potentials offered by the technologies. The pedagogical challenges lie in finding a coherent alignment between learning goal, form of instruction and support, and choice of technology.

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Acknowledgements

Finally, the last sentence is written on this story. In the book, I have, with a researcher's voice, narrated my version of how a pedagogical practice may look like in a time of change. Writing a doctoral thesis is by no means a single person's effort; but rather is the result of a collective authorship involving several people. In a preface, therefore, acknowledgments to all these co-writers and supporters should be duly announced.

The entire work has been conducted in Child and Youth studies and within the framework of two research schools. Firstly, *Nationella forskarskolan för ämnesdidaktik i mångfaldens förskola. Förutsättningar och möjligheter för barns språkliga och matematiska utveckling och lärande* (FoBaSM), in which I took a licentiate degree in 2014, and secondly, *Centrum för utbildningsvetenskap och lärarforskning* (CUL) where I was given the opportunity to complete the doctoral thesis. I would like to thank all of you involved for contributing to an exciting time, especially my fellow PhD candidates, it has been a pleasure to meet you all and share your expertise as professionals and curiosity as researchers.

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Jerome Bruner wisely wrote that attending a postgraduate education does not only imply learning the craftsmanship, it also means learning a culture. The two most important persons who have given me guidance in academic culture and in the demanding art of academic writing are my supervisors, *Niklas Pramling* and *Annika Lantz-Andersson*. Thank you both for being such outstanding tutors - I have learned so much from you.

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I have had the privilege of being involved in two text seminar groups at the Department of Education, Communication and Learning that have been a rich

Chapter 1 Introduction

The aim of the present doctoral thesis is to contribute to knowledge on how technology-mediated literacy events, in terms of storymaking, are constituted within the institutional context of the preschool class. What brings forth the research interest is that literacy today, without exaggeration, is strongly linked to digital technology[1]. At an overall societal level, the technological development to a large extent pervades Western life, including all its social institutions, and recently the Swedish Government Office has formulated a national digitalisation strategy (*För ett hållbart digitaliserat Sverige – en digitaliseringsstrategi*). The development is particularly noticeable in the education system through the implementation of digital technologies in classrooms, but also in revised policy documents. This entails a reconfiguration of the educational conditions, which logically generates new questions about what technology implies for instruction and learning (Lantz-Andersson & Säljö, 2014; Selwyn, 2016). Clearly, issues concerning the role of digital technology in education as well as what it means to be literate in an increasingly global and digital world are in the midst of the public debate and high on the political agenda.

A common rhetoric in both national and international policy documents tends to emphasise the need to educate and develop children's numeracy, literacy and digital competences (e.g. OECD, 2005; The Joint Research Centre, 2017; The Swedish National Agency for Education, 2016, 2017). This rhetoric is primarily based on arguments concerning society's future needs and requirements for its citizens, Jernes (2013) notes. Within the field of early childhood literacy research, however, it is argued that, by navigating on digital devices, children receive experience early on from digital media texts, comprising of a potential multitude of symbols, signs and sounds, in which they engage (Burnett, 2010; Fast, 2007; Klerfelt, 2007; Marsh 2005, 2010; Roswell &

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[1] In the present thesis, I use the term digital technology (or in plural technologies) as an overall term for a range of hardware devices and software programs. In the school law and in the Swedish curriculum for the compulsory school, preschool class and the recreation centre, the terms digital technology and digital tools are used. When addressing the studies, I specify the particular devices and software that are used in each study.

Harwood, 2015; Wohlwend, 2015). For that reason, it is not sustainable to regard them exclusively as "becomings", but rather, they also need to be recognised as "beings". That is, children's agency needs to be acknowledged in terms of their participation in social literacy practices driven by their own interests and purposes. For early childhood education, this proposed alternative view should induce reconsiderations of young children's literacy learning, which appears to differ from traditional print-based practices (Larson & Marsh, 2013). From this reasoning, two key questions emerge for the research field: First, what experiences do children bring into the classroom and what possibilities are offered to use them? Second, what constitute optimal literacy practices (Sefton-Green, Marsh, Erstad, Flewitt, 2016)?

This starting point demands systematic research interested in children's sensemaking and creativity with digital technologies in pedagogical practices. Such empirical studies can potentially contribute to teachers' understanding of the literacy processes taking place. In the present thesis, the central concept of the field 'agency' is not employed; however, as the title indicates, the work adopts a holistic approach to the studied literacy events, which implies an inclusion of both the children's and teachers' participation, the tools involved, as well as the particular setting. The research object could therefore be said to be located at the intersection of instruction and learning.

Literacy and narrative in early childhood education

Historically, the English word *literacy* encompassed reading and writing skills, but in the pace of the expansion of digital technologies, the concept has been broadened to include a variety of interpretations and definitions and is now on the verge of dilution. Examples of the plethora of terms include film literacy, television literacy, science literacy, media literacy and digital literacy (Livingstone, 2009). It appears as though literacy almost constitutes a metaphor for competence[2] (Lankshear & Knoble, 2011). Central within the relatively new

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[2] The White paper of COST Action (Sefton et. al. 2016) discusses the risks of how adults' understanding of a concept can have consequences for children's perception of the same. For example, presenting digital literacy as a technical skill or a cognitive tool can prevent children from perceiving the creative possibilities that technology may offer. The COST Action is a European multidisciplinary network of researchers, teacher educators and policymakers from 33 countries coordinating knowledge about the digital and multimodal literacy practices of young children with the age range of 0–8 years.

field of early childhood literacy, however, is the notion that literacy or literacies are socially-situated sensemaking practices that are historically and culturally constituted (Larson & Marsh, 2013). I will further elaborate on the concept in the chapter on previous research.

Studying literacy practices is a difficult task, and accordingly research should instead focus on delimited and observable events derived from the practice, argued Barton (2007). By compiling the findings from a variety of such studies, an image may emerge with clues to how the overall practice is co-constructed by the involved participants and tools within a specific environment. In the present thesis, a literacy event is understood in relation to the larger socio-cultural literacy practice in which the event is situated, namely in the preschool class (see theory chapter for further discussion). Furthermore, in line with Brice Heath's (1983/1996) definition, a literacy event is considered an activity that includes written text of some kind. However, I adopt an understanding of text as involving semiotic means, such as spoken language, gestures, letters and other symbols, colours and images, and which forms a coherent contextual whole. There are several ways to approach literacy in early childhood education. For example, the narrative genre[3] has traditionally been used as a vehicle for engaging children in linguistic actions, such as talking and reading as well as writing (Taube, 2011). One reason for its prominent place could be that storytelling, as Gattenhof and Dezuanni (2015) maintained, constitutes a successful link to children's participatory engagement as it applies to their everyday life worlds. Another suggested reason could be, as several empirical studies have shown, that narrative activities are linked to children's linguistic worlds and thus support literacy learning (e.g. Björklund, 2008; Wells, 2009). For Bruner (1996), narratives have a more specific function as a tool for thinking, meaning-making and communication (see the theory chapter).

A narrative can be expressed in many forms; in a verbal story, for example, the speech flow and the intonation are the mediators of meaning, while a written story conveys meaning through systematically regulated graphic symbols. The latter undoubtedly poses other demands on a young narrator than the former (Vygotsky, 1987). A narrative can thus be manifested through different communicative, or semiotic means, and a transformation between

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[3] Narrative is a scientific concept. Story is used as an everyday term. However, in this study, I will use the two words synonymously and interchangeably for stylistic variation, as is a common practice in the research literature (cf. Bruner, 2002). The concept of narrative will be further elaborated in the theory chapter.

them may imply challenges and a laborious learning process. What semiotic means are used by the observed children and how they are applied is one of the interests in this thesis.

How to refer to the studied events in the present thesis is not self-evident; whether they are examples of storytelling or storymaking activities. During the research process, I have become aware that in the research literature scholars use these terms interchangeably, although I would argue that there is an important distinction between them. Telling primarily refers to speech; however, in the observed activities several communicative means are simultaneously integrated, such as speech, gestures, symbols, sound, images and occasionally colour. Therefore, since the activities are carried out with multiple means (i.e. are multi-modal in character) and to define how children bring together different elements with the aim of composing something new, storymaking can be seen as a more functional term than storytelling. In relation to technology, the notion of storymaking is particularly useful since creating a story digitally provides an array of semiotic signs. Moreover, storymaking denotes a more active role of both the speaker and the listener than storytelling, which primarily indicates the speaker's activity (Gattenhof & Dezuanni, 2015).

In this context, it is important to clarify that the starting point of the thesis is not what is sometimes referred to as digital storytelling. In the early 1990s, The Center for Digital Storytelling in the United States was founded (Lambert, 2013) with the aim to educate and assist people in creating and sharing their digital stories. Considerable emphasis is put on the digital tools and the products, or the relation between the narrator (child or adult) and the technology. The interactional dimension and the teacher are largely omitted from this model. In contrast to such a model, the present thesis explores how storymaking is interactively achieved, where participants (children and teachers), tools (digital and others) as well as the setting are critical to include in the unit of analysis (for further discussion see the theory chapter). This entails that the participants are understood as collaboratively interacting in the situated activities. In accordance with Littleton and Mercer's (2007) definition, *collaboration* implies more than just people working together; it is seen "as involving a coordinated joint commitment to a shared goal, reciprocity, mutuality and the continual (re)negotiation of meaning" (p. 25). Hence, in the thesis, the term embraces the children's work to jointly achieve the task of making a story. Referring to the observed literacy events as collaborative

storymaking activities may thus be a suitable starting point for studying children's narration with digital technologies.

Digital technologies in children's lives and education

A body of research shows that English children from an early age have growing access to digital technologies, such as computers, digital cameras, tablets, mobile phones and other technical equipment in their homes and in pedagogical settings (see e.g., March, 2005, 2010; Plowman, Stephen & McPake, 2010). A similar picture begins to emerge through Swedish studies and is further proven by recent statistics based on various surveys conducted during 2016 (Swedish Media Council's Annual Report, 2017). The report shows that children's (in the span of 5–8 years) media habits in their homes have increased significantly since 2014, and this is to a large extent due to the availability of mobile phones. Between 2012 and 2014, the use of computer tablets for playing increased significantly, although this trend seems to have levelled out (Swedish Media Council's Annual Report, 2017). Moreover, the figures show that the daily internet use among five- to eight-year olds is continuously increasing, with half the eight-year olds using it on a daily basis. Still, the most common media for this age range is television (Swedish Media Council's Annual Report, 2017). The growing access of digital technologies is also reflected in Swedish early childhood education, even if there are variations in the country (The Swedish National Agency for Education, 2015). In preschool, for example, there are an average of 8.2 children for each computer or computer tablet in 2014 compared to 12.5 in 2012. Accessible technology does not automatically mean a regular use, however, according to The Swedish National Agency for Education (2015) report, the teachers indicate daily use both by themselves and the children. Taken together, research and statistics provide an image of the technology-intense lives of young children, both in and out of school. Yet – I suggest – we largely lack knowledge of how digital technology mediates their sensemaking and learning.

Historically, the introduction of new technologies in education has led to expectations of a transformation of the pedagogical practice. Similar lines of thinking have existed since the late 1950s when digital technology gradually became introduced in schools. At times, technology was perceived as a substitute for the teacher, and there were even concerns that it would mean the

end of traditional education (Cuban, 2001). Today, the discussion still prevails, although contradictory opinions about the digitalisation are simultaneously heard, especially in relation to early childhood education. On the one hand, voices uncritically argue for its potential for learning; on the other hand, there are more voices heard expressing moral panic over the loss of outdoor play, being replaced by, what is sometimes referred to as "toxic" screen-based lifestyle, which contributes to lowering children's IQ level (Kvarnlöf, 2018). The starting point for these deterministic assumptions is generally found in the technology per se, rather than in how it is used, and they usually build on a simplified reasoning about the relationship between technology and learning (Säljö, 2010). The century-old history of the educational system is rarely considered, which contributes to a certain inertia regarding changes[4] (Säljö, 2010). For decades, strong traditions have evolved and contributed in forming that "every practice has its own logic and a way of working that cannot be subordinated to the technologies, instead the technologies have to be integrated into the conditions of this practice" (Lantz-Andersson, 2009, p. 109). How this integration most beneficially is implemented and accordingly how the pedagogical practice is reconfigured is still a subject of research.

The research field provides a contested picture of technology's significance for learning. Within the area of early literacy there are, for example, arguments about how the use of computers or applications may enhance different aspects of children's literacy development (Labbo & Reinking, 2003), such as increased vocabulary (Sandvik, Smørdal & Østerud, 2012), text production and genre awareness (Hultin & Westman, 2013). In contrast, research conducted within a neuro-scientific perspective claims that print-based activities by 'hand' improve literacy learning in favour of typing on a keyboard (cf. James & Engelhart, 2012). A contributing reason to the current ambivalence may be the fact that digital technologies are primarily not designed to stimulate learning and therefore generate issues of a pedagogical nature (Säljö, 2010). In this context, it is necessary to mention the large 'edutainment' industry that manufactures software aimed at providing embedded learning within an entertaining framework. However, its role in preschool and school is controversial, Buckingham and Scanlon (2005) maintain. The influence of commercial interests driven by agendas and ideologies other than education raises

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[4] For an historical account of the implementation of digital technologies in preschool, see Ljung Djärf (2004), and in school Karlsohn (2009).

challenging questions about what values we want to promote through public education (Selwyn, 2016). However, in the present thesis I will not elaborate further on the issue.

Important actors in the context of education are the teachers. Research as well as official reports have shown that the teachers are not unanimously in favour of implementing digital technologies in their pedagogical practices. This is for example evident in studies conducted in the UK, indicating ambivalence towards inclusion. The reasons seem to be found in teachers' attitude, lack of knowledge and confidence in using technology with children (Burnett, 2010; Flewitt, Messer & Kucirkova, 2015; Robert-Holmes, 2014; Yelland, 2011). To a certain extent, this picture is consistent with Swedish conditions (cf. Klerfelt, 2007), although, in contrast, Ljung-Djärf (2004) shows in an early study that the preschool teachers had a mainly positive outlook towards computers and had a desire to develop its use to meet the curricular goals. According to The Swedish National Agency for Education (2015), most participating preschool teachers included in the already mentioned report consider digital technologies as important pedagogical tools, although they largely demand professional development.

During the conduct of the empirical work in 2012–2014, computer tablets were not available in the classrooms I visited, nor had the Swedish curriculum for the compulsory school (Lgr11) yet been revised. However, at the time of writing the extended summary text, the revised version, that will enter into force in July 2018, has been published with a supplement of the term digital competence. The purpose is to reinforce the digitalisation assignment commissioned by the government. The term derives from the European Union's (EU) outlined eight key competences considered necessary for future citizens and for lifelong learning. Briefly, a competence[5] is described by the EU as a combination of knowledge, skills and attitudes (see further SOU 2015:28, for an historical account of the concept). One of the identified key competences is the digital, which is defined as familiarisation with handling digital technologies and having a critical approach in digital use at work, leisure and in communication. The OECD research group DeSeCo was also involved in this work, and they linked values, emotions and literacy to the term. Thus, digital competence has been formulated in international policy documents, but it has

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[5] Research has also attempted to sort out the components of digital competence. For instance, Erstad (2010) made an effort to organise general competences that define the operational aspects of technology and its informational content employed in school practice.

not been prominent in Swedish texts until recently. The definition introduced by Digitaliseringskommissionen (SOU 2015:28) is based on the above (see p. 102), and together with a government decision on a national digitalization strategy for education (Ministry of Education and Research, 2017) the texts form the basis for the revised school curriculum. As mentioned, at the time of my empirical work digital competence was not commonly used in Swedish educational science context. However, I included the term with reference to DeSeCo in Study III to position the study in an international discourse.

The preschool class as a particular school form

As part of the changing education system, the preschool class is a particular form of pedagogical practice that has increasingly been the subject of political discussions. Although constituting a one-year-form of education for six-year olds since 1998, it demonstrates a practice filled with contradictions and pedagogical challenges. The stated reason, according to an evaluation report from The Swedish Schools Inspectorate (2015), is implicit conditions governing this intermediate school form, inter alia the ambiguity as to the educational content and teaching forms. These circumstances seem to risk unequal quality and are believed to threaten equivalence. In addition, the vision of the preschool class functioning as a bridge between the preschool and primary school traditions has proven hard to stage, likely due to the long-established cultural practices that are pervasive. That is, the preschool, with its primary focus on nursing and care, differs from the school's structured teaching. Thus, an image appears that differs from the government's original intention to weave the two pedagogical traditions with the aim of developing a new tradition based on an approach of the playing and learning child[6] (see further Prop, 1997/98:6). However, when analysing texts in policy documents, Ackesjö (2014) noted a shift in perspective in which the integration thought seems "toned-down […] in favour of instruction and learning" (p. 35, my translation). At the same time, to my understanding, the cooperation between school forms is reinforced in the recently revised curriculum from 2016, pointing out a particular responsibility for both principals and preschool teachers. Nevertheless, the stronger emphasis on preschool class as a school preparatory year can be

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[6] For extended historical accounts, see e.g., Ackesjö (2014) and Skoog (2012).

distinguished by the orientation towards an academic-subject-related position rather than social pedagogy, Ackesjö and Persson (2016) argued.

Similarly, research shows the consequences of the ambiguity of the pedagogical content and the uncertainty about the assignment that it entails. Moreover, the lack of teachers' opportunities for shared exchanges of pedagogical questions contribute to discontinuity for children's learning (Fast, 2007; Sandberg, 2012; Skoog, 2012). Bridging the communicative patterns across institutions may implicate challenges since institutions are socially and culturally organised practices characterised by specific discursive features, involving "conversation routines, artifacts and arrangements that are relatively stable, and which people learn to relate to and act within" (Säljö, 2005, p. 46, my translation). They are, however, not static, but maintained dynamically through continuous negotiations and actions by those involved[7] (Säljö, 2005). For the preschool class, which is characterised by being in the border between two cultural traditions, the renegotiation of practice becomes a continuous process.

From her ethnographic study on children's various literacy practices in-and-out of pre/school, Fast (2007) drew the conclusion that, as the preschool class is part of the elementary school curriculum, "there has arisen confusion about where early reading and writing teaching should be conducted" (p. 168, my translation). The findings from Fast (2007), Sandberg (2012) and Skoog's (2012) studies show an analogous picture of how six-year-olds encounter a teacher-oriented literacy practice reminiscent of the school's formalised reading and writing instruction based on the traditions of phonics. This implies a pedagogy encompassing isolated activities, for instance, in terms of letter work (Fast, 2007; Sandberg, 2012) or structured language-play directing focus towards the formal aspects of the written language system, rather than functional writing in meaningful communicative contexts (Skoog, 2012). Free play was allocated space, albeit held separate from teacher-led activities (Sandberg, 2012; Skoog, 2012).

From what has emerged, the question arises of how to arrange beneficial literacy activities for both play and learning based on the definition of teaching or instruction formulated in the school law, "such goal-governed processes under the guidance of teachers or preschool teachers that aim at development

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[7] In my research this defintion of institution is adopted.

and learning through the acquisition and development of knowledge and values" (SFS, 2010:800, my translation).

To address the problems surrounding the preschool class and clarify its assignment, The Swedish National Agency for Education has, on behalf of the Government, recently revised the curriculum for the compulsory school, preschool class and recreation centre (Lgr11) twice. In the first version from 2016[8], the preschool class received a new special chapter of guidelines pointing out central educational content areas, such as language and communication. It is stated that the practice should provide opportunities for children to meet and produce various kinds of texts consisting of multiple means, such as spoken and written words, images and sound, within different genres, such as narratives and prose (The Swedish National Agency for Education, 2016). Central is also the inclusion of digital technologies and media for communication and creativity.

Moreover, in line with the increased knowledge orientation, the importance of preschool class as a first step into the education system is further emphasised through the Swedish parliament's decision to make it compulsory from the autumn semester 2018. Consequently, the extension by one year implies a school start at the age of six and a 10-year compulsory school attendance[9] (Prop. 2017/18:9). The decision affects only a small number of Swedish children, however, since approximately 96% of six-year-olds are already enrolled. As mentioned previously, at the time of my observations this policy document did not apply, but the one from 2011 did.

A sociocultural perspective on technology-mediated activities

The theoretical framework underpinning the present work is a sociocultural perspective on learning (e.g., Säljö, 2000, 2005; Vygotsky, 1987; Wertsch, 1998, 2007). This point of departure implies a view of people's learning as a consequence of their situated sensemaking, that is, how we understand and experience the world, make use of knowledge and learn largely depends on the social and cultural context in which we participate. An important theoretical

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[8] The second version from 2017 is discussed in the previous section.
[9] The decision is based on a committee report: *Mer tid för kunskap – förskoleklass, förlängd skolplikt och lovskola* [More time for knowledge – preschool class, extended compulsory school attendance and vacation school (SOU, 2015:81).

concept in this perspective is mediation (Vygotsky, 1987; Wertsch, 2007), building on the idea that human action, including perceiving and taking part in the social and physical world, is shaped by the use of cultural tools. Introducing a new physical tool or a sign into a practice does not simply facilitate the activity in terms of making it more efficient, but qualitatively transforms psychological functioning and practical operations (Wertsch, 2007). This reasoning entails, for example, that digital technologies cannot merely be discussed as neutral tools for learning. Rather, since technologies are a part of historical events embedded in specific social and cultural practices they create new and distinctive contexts, which simultaneously implies both possibilities and constraints for learning (Lantz-Andersson, 2009; Säljö, 2010).

Accordingly, to understand people's engagement in a social practice, it is not possible to separate parts, such as meaning, gestures, linguistic actions, interaction and physical tools and treat them independently (Lankshear & Knobel, 2011). For research, this implies a unit of analysis that preserves the characteristics of the entity, which in the present thesis is the technology-mediated storymaking activity taking place within a preschool class setting. I will return to this point of departure in the theory chapter.

Research aim and questions

The aim of this thesis is to contribute to the understanding of what kinds of *in situ* activities emerge when children are instructed to create stories in collaboration by the use of digital technologies within the context of the preschool class literacy practice. The ambition is to gain a deeper understanding of the interplay between the participating children, the teachers and the digital technologies that are part of the evolving activities. This relationship will be examined from the perspective of the children's sensemaking and engagement in the task, and in what ways the teachers' participation contributes to and supports the children's engagement. The analytical focus is directed towards the participants' linguistic actions and their use of other cultural tools.

The following overall research questions have guided the studies:
- In what ways do digital technologies, other cultural tools and teachers' scaffolding mediate children's storymaking activities?
- What instructional challenges emerge in technology-mediated activities in the preschool class context?

The present thesis consists of four[10] empirical studies and an extended summary that presents a longer discussion on the findings in relation to previous research. The empirical material was generated by video observations in two preschool classes, in three different groups of children with two preschool teachers. In Study I the focus is primarily directed towards the institutional conditions and how they mediate the children's collaborative storymaking. Study II is concerned with the relationship between what unfolds in the interaction and the resulting stories. Study III highlights what become structuring resources in the children's narrative negotiation. Study IV investigates what the participants are oriented towards in the activities and what role uttered aesthetic judgements play in the activities.

Guidance for readers

The present thesis is structured in the following manner. Part 1: chapter 1 provides an introduction. Chapter 2 discusses the theoretical framework of a sociocultural perspective through the concepts used in the analyses, for instance, mediation, cultural tools and scaffolding. In the ensuing third chapter, I present an overview of previous studies concerning literacy, narrative and digital technology in relation to early childhood education. Thereafter follows the method chapter (fourth), accounting for the pedagogical setting in which the empirical material was generated and how the studies were designed and conducted. Then, a summary of the four empirical studies is given in chapter five, and in chapter six the empirical findings are discussed. In the final chapter seven, a Swedish summary is provided. In the second part of the thesis, the four articles are presented in full.

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[10] Studies I and II are included in my licentiate thesis from 2014.

Chapter 2 Theoretical perspective

In this chapter, the theoretical framework and the relevant analytical concepts are presented.

Introduction

The overall theory underpinning the research interest is a sociocultural perspective. Rather than presenting the theoretical framework at large, which encompasses many 'branches' due to various interpretations of the cultural-historian Lev Vygotsky's original work (Cole, 1996), this first part of the thesis accounts for the relevant theoretical concepts used in the empirical studies (see part two of this thesis). Accordingly, in this chapter, the ambition is not to provide an extensive account of the broad socio-cultural tradition; rather I draw on work foremost developed by contemporary scholars, such as James Wertsch (1998, 2007) and Roger Säljö (2000, 2005, 2015). These two scholars emphasise the role of cultural tools in society and in human action, and the latter has written extensively on digital technologies and their implications for education, which is highly relevant to this thesis. In addition to the sociocultural perspective, the work of the cultural psychologist Jerome Bruner (1996, 2006) in which he attended to the generic function of narrative as a mediating tool for human thought, and its role in pedagogical contexts, has guided the studies. Moreover, evoked by the empirical material, the conceptualisation of aesthetic experience offered by the philosopher John Dewey (1934/1980) is partly used.

Three perspectives are represented here, which can be assumed to have harmonizing starting points that contribute to their common classification in the tradition of educational theories (see Greeno, Collins & Resnick, 1996). What unifies them is, for example, their epistemological view on learning as primarily grounded in social experiences and knowing as distributed in situated activities by interacting individuals (Bruner, 1996; Dewey, 1916/2009; Vygotsky, 1987). Thus, learning is understood as a communicative and sensemaking activity generated by engagement in thought and other actions (Säljö, 2015). This implies that an ongoing activity should be meaningful in the present (i.e., for a child in her childhood rather than only in future adulthood),

and in part constitute continuity in her experiences. In the early childhood literacy research field, this is also a central premise. The sociohistorical/pragmatic/culture-historical perspectives, all consider the formal educational system to be a significant institution, in terms of functioning as a social arena for juxtaposing people's experiences and knowing. Furthermore, perspectives with these bases highlight the importance of culture and historically developed tools, foremost, but not exclusively, language, the use of which contributes to our understanding of the world.

In the following sections, a limited selection of central and closely related concepts from the mentioned theoretical perspectives are presented and discussed in relation to their operationalization in the four studies. These concepts are organised in turn; *learning* followed by *cultural tools*, *mediation* and *appropriation*, then *language* and *sensemaking*, and then *situated context* and *activities*, thereafter *culture*, *narrative as a cultural tool*, followed by *structuring resources*, *intersubjectivity*, and finally, *scaffolding*, *creativity* and *aesthetic experience/judgement*.

A sociocultural perspective on learning

According to Vygotsky (1978), an individual's learning originates from experiences in social interaction. He formulated his thoughts in the famous "law of sociogenetic development", which states that a child's cultural development starts on the social level (interpsychological) and then transforms him/her on the individual (intrapsychological) level, where language constitutes the interconnection of the 'external' and 'internal' processes (Vygotsky, 1978). Due to ambiguity around the adjoining notion of 'internalisation', and the dualistic thinking[11] it implies, the metaphor for learning in this perspective has come to be replaced by the concept of *appropriation*, which denotes an active and gradual mastery of cultural tools (Säljö, 2015). In this way, a sociocultural perspective avoids the individual reductionism offered by cognitivism, which isolates the individual mind by disregarding the cultural tools necessarily involved in a mediated activity. How an appropriation process unfolds is considered contingent on what opportunities for sensemaking and engagement that are available in a particular situation. This reasoning implies a view of learning as a consequence of the sensemaking taking place in a socially and culturally

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[11] The relationship between the individual and the social, and the conceptualization of social are problematic since different understandings exist depending on interpretation and elaboration of Vygotsky's work. For further discussion, see e.g. Daniels (2001).

embedded activity (Säljö, 2000, 2015). Regardless of whether the situation is pedagogically organised or not, learning occurs, but we cannot with certainty know how or when it takes place, or what is learned. An indication of learning though, is a person's changed way of reasoning in speech and by other actions (Säljö, 2000).

In other words, learning, as conceptualised from a sociocultural theoretical point of view, means gradually mastering different cultural tools and thereby evolving new ways of making sense of and interacting with the world. There is, however, an irreducible tension, as Wertsch (1998) puts it, between an agent (individual) and the historical, cultural and social context in which the action is negotiated and performed. To gain an understanding of these relationships, which are inevitably intertwined, it becomes crucial to include people's involvement with cultural tools in the analysis, as well as the surrounding social environment where the participants are active. In research, however, it is useful to distinguish these aspects to reveal their relationship.

Cultural tools, mediation and appropriation

Cultural tools refer to physical tools (artefacts), and intellectual/psychological tools[12] (signs) (Vygotsky, 1978). In his reasoning, Vygotsky makes a distinction between tools and signs in the following manner:

> The tool's function is to serve as the conductor of human influence on the object of activity; it is *externally* oriented: it must lead to changes in objects. […] The sign, on the other hand, changes nothing in the object of a psychological operation. It is a means of internal activity aimed at mastering oneself; the sign is *internally* oriented. (Vygotsky, 1978, p. 55)

This division is merely analytical to understand the higher forms of behaviour and mental processes, which he wrote, could only be developed through the use of signs and not by tools (Vygotsky, 1978). However, the outlined distinction between tools and signs is difficult to maintain since they simultaneously are both conceptual and material, as a result of being developed in the material world (Cole, 1996). To illustrate this complexity, Wells (2007) provided an example, which additionally highlights the importance of context to understand the mediating function a tool serves:

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[12] In discussing psychological tools in this thesis, the notion of means is used interchangeably.

> When I am digging my vegetable garden, the spade mediates my material activity as I turn over the soil; in this context, it is clearly a tool. But if I am interrupted, I may leave the spade at the point I have reached as a sign to 'tell' me where I should continue when I return to the task. (Wells, 2007, p. 246)

Being the same object, the spade at first functions as a tool for physical work, and is then, in use, transformed into a psychological tool/sign, functioning as a mnemonic device. This ambiguity was also recognised by Vygotsky, who stated that signs and tools are separate entities although mutually linked in the mediated activity, and he further suggested that the use of a physical tool may broaden "the range of activities within which the new psychological functions may operate" (Vygotsky, 1978, p. 55). This could be exemplified by the invention of the writing systems, for instance, the cuneiform, the alphabet and the Chinese logographic system. As a physical technology for communication, they have had a major impact on human activity by serving as a mediating tool for structuring our ideas about the world in culturally relevant ways (Säljö, 2000). Depending on perspective, the writer's or the reader's, the script has various functions besides being communicative, such as a mnemonic tool, or a model for language and thinking, Olson (1994) argued. In this sense, being material, written texts have cognitive implications[13]. Yet another example of the increasingly blurry borders between psychological and physical tools is digital technology. A computer, or a tablet, constitutes a physical object serving as a working tool of any kind, such as writing or drawing. Simultaneously, while we interplay with the device to solve a problem or to create something, it serves as a psychological tool for our thinking. Physical tools included in our social practices are often used without us being fully aware of the human insights that are historically built into them. Their inherent functions are thus invisible to us[14].

The closely linked interplay between our actions and tools is described within a sociocultural perspective by the central concept of *mediation*. Mediation refers to the premise that we are not in direct contact with the surrounding world but interpret it by the use of various tools; these thus have a mediating role in our sensemaking (Vygotsky, 1987; Wertsch, 2007). People's use of tools

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[13] See Olson (1994) for an extended and problematizing discussion of theories of the implications of literacy.
[14] Latour (1999) defines this phenomenon as black-boxing and describes it as follows: "When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity" (p. 304).

varies depending on the context, but also on their characteristics, and the nature of these tools qualitatively transforms the ways in which we think, communicate and act (Wertsch, 2003). Therefore, mediation is considered a dynamic process. In Vygotsky's work, the concept was central, although he elaborated and applied it in various ways depending on which disciplinary tradition he addressed (Wertsch, 2007). In the present thesis (more explicitly in Studies I, II and III), semiotic mediation is adopted, which emphasises language as most significant for our sensemaking (I return to the role of language below). The main analytical focus has been on how linguistic actions, such as choice of words, utterances and gestures, mediate participants' negotiations and their actions in continuing interaction. This implies analysing the participants' responses to each other's speech and other actions, as well as responses to what takes place on the screen, and in the classroom.

Becoming familiar with a cultural tool tends to involve some resistance. To master the resistance and develop an ability to use a tool in a more or less unconstrained and relevant way in various social and cultural contexts implies a long process of active sensemaking (Pramling & Eriksen Ødegaard, 2011; Säljö, 2015). As already mentioned, this process is conceptualised as *appropriation*[15]. In interpreting the English translation from Russian, Wertsch (1998) stated that: "the process is one of taking something that belongs to others and making it one's own," (p. 53). Wertsch also made a distinction between mastery and appropriation[16]. That is, mastery entails a child's use of a cultural tool before actually understanding how it works (often by imitating an adult or a more competent peer), and eventually after having employed it repeatedly, the child becomes conscious of its functionalities and is able to use it in various situations (thus having appropriated the tool). An example of this process is a child's initial writing that commonly starts with imitating writing behaviour, followed by play-based writing (scribbling and forming letters arbitrarily often together with drawing). As the child increases her phonological awareness and understanding of the relationship between sound and letter, she progresses towards a more grammatically correct way of writing. Yet, this appropriation implies increased knowledge of the writing system rules (the formative aspect), but additionally understanding of its communicative function

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[15] The concept originates from Bakhtin and has come to replace Vygotsky's internalization. The reason for the exchange is the connotation of internalization that signals a cognitivist view of learning, as transmission between outer and inner (for discussions see Daniels, 2001, and Wertsch, 1998).

[16] In this thesis I choose not to use Wertsch's distinction, as it is beyond my research focus.

with the symbolic conventions that historically are built into words and sentences (Liberg, 2007). Most researchers within the field of literacy support this view, but, as in any research field, there are disagreements (related to theoretical points of departure) about how literacy instruction should be designed in education. It must be noted that from a sociocultural standpoint, an individual will never be fully learned, rather being in a continuing sensemaking process. In analysing the present empirical material, trajectories of appropriation are not at the forefront since that usually involves observation of children's technology-mediated activities over longer time (however, Wallerstedt, Pramling & Säljö (2015) maintained and shows empirically that it is possible to study appropriation micro-genetically).

Language, sensemaking and meaning-making

Based on Vygotsky's writings, a sociocultural perspective conceptualises language as a tool for action, rather than a mere formal system (Wertsch, 2008). In being transformative, language consists of a flexible sign system (Säljö, 2015) that can be used differently depending on specific needs and contextual circumstances. On the one hand, it has a demonstrative/indicative function that allows pointing out objects by their names and their characteristics, such as colours and forms. On the other hand, its semiotic function implies the relation between linguistic expressions and the phenomena/objects to which they refer or that the meaning they signal provides scope for interpretation (Säljö, 2000). This entails possibilities for a more creative and socially negotiable use of the semantic content of words, contingent on the work of interacting participants to establish temporarily sufficient intersubjectivity (I return to the concept of intersubjectivity later).

The adopted sociocultural perspective has a broad view of language, which implies that it is not limited to speech or writing, but in addition encompasses gestures and other forms of expression. Children's diversity of linguistic expressions is especially visible during play and narration when gestures and speech are commonly used synchronously. The key to development of symbolism, Vygotsky (1978) claimed, is representational gestures, which function as visual signs and constitute "very complex system of speech" that "communicate and indicate meaning" (Vygotsky, 1978, p. 108). By comparing language and narrative, Engel (1995) maintained that, "narratives, like language

more generally, have the same overarching functions; we construct stories to think with and to communicate" (p. 26).

Thus far in this presentation, the concept of sensemaking has been used. It must be clarified that Vygotsky (1987) made a distinction between meaning and sense. By meaning, Vygotsky (1987) referred to a lexical, stable, culturally and socially unified understanding of words. In contrast, sense is according to Vygotsky dynamic in nature due to individual's interpretations of specific situations where they are. Bruner (1996) illustratively pointed out the centrality to situate what he termed meaning-making:

> Meaning making involves situating encounters with the world in their appropriate cultural contexts in order to know "what they are about". Although meanings are "in the mind", they have their origins and their significance in the culture in which they are created. It is this cultural situatedness of meanings that assures their negotiability and, ultimately, their communicability. (Bruner, 1996, p. 3)

While Bruner merely used the term meaning-making, he, in a similar vein as Vygotsky, highlighted the relation between the cultural level and the individual level. According to my understanding, Bruner made the point that in our endeavour to make sense of the specific situation we are involved in, we relate to the cultural conventions that surround us and common social experiences. In the present studies, this premise has guided the analyses of particularly how the children make sense during the narration and what sources they use. Bruner and Vygotsky's terms (i.e., meaning and sense) are, however, used interchangeably since the difference is not emphasised when analysing the empirical material, although an effort has been made to follow their use when referring to them in the studies.

Situated context and activities

In the eighties, when a sociocultural view of learning came to gain ground, awareness increased that thinking, communicating and acting are *situated*. This means that what we learn and how we learn are largely dependent on situational conditions. As a result of this insight, the importance of *context* was highlighted and led to several conceptualisations (van Oers, 1998). For instance, Cole (1996) distinguished between three different theoretical understandings; context as a synonym for situation, context as surrounding and context in terms of weaving or connecting things together. The latter involves "a qualitative relation

between a minimum of two analytical entities" in a process (Cole, 1996, p. 135). While all understandings depart from some sort of surrounding, the first two definitions of context imply a much too simplistic view, van Oers (1998) argued. Instead, he proposed an understanding of context as emerging from (social and linguistic) interaction between participants in cultural activities that are tied to experiences and meaningful actions. The ways participants actively use cultural tools have implications for the construction of contexts (Daniels, 2001). Thus, rather than a static entity that precedes action, contexts are understood as being dynamically shaped by participants' engagement and negotiation, contingent on their thinking and actions with available tools as well as the physical environments (Säljö, 2000). The outlined latter definition of context is adopted in the present thesis.

The concept of *activity* has an ambiguous and chequered history (Kozulin, 2005). In this thesis, activity is delimited to a unit, having an obvious start and an ending, and is initiated either by someone spontaneously or organised in institutional settings, such as preschool and school. On the one hand, people's actions interplay with the activity; on the other hand, the activity interplays with the actions. Therefore, the activity and the actions within the activity are understood as mutually constituted and intertwined. Based on this understanding, technology-mediated activity is selected as the unit of analysis in the thesis as it constitutes the minimum unit for preserving the characteristics of the storymaking activities observed in the preschool class. The choice implies an opportunity to investigate the relationship between the participants' actions, the cultural tools involved, and the institutional setting with its routines and traditions, to identify the participants' sensemaking *in situ* (cf. Wertsch, 1998).

Culture

Culture is an elusive concept found in many disciplinary fields, and consequently is subjected to numerous definitions. I do not devote much space in this text to elaborate further on the concept. I merely use culture in relation to tools as defined here, and to some extent in relation to popular media. In this sense, the two following formulations guide the studies; on a macro level, Säljö (2000) defines culture as a set of ideas, values, knowledge and resources occurring in a society. On a micro level, Bruner (1996) perceived culture as expressed through individuals assigning objects certain meanings depending on in what context they participate. These two levels do not exist in parallel but co-constitute each

other. That is, the norms and values of society have importance for how an individual interprets and makes sense of a situation. In the 'opposite direction', an individual's actions may contribute to the formation of culture in different ways, arguably, primarily at the institutional level. For Vygotsky, an actualization of culture in individual action takes place within a social activity, and is "embodied in the symbolic function of gesture, play, and speech systems" (Kozulin, 2005, p. 105). Considering that the social and cultural ecology of people's lives differ across groups of societies in the world, the needs and therefore inventions and development of cultural tools varies. Thus, cultural tools are historically, socially and culturally developed by people partly for communication and labour purposes and are "part of a pre-existing, independent stream of communicative action" (Wertsch, 2007, p. 181).

Narrative as a cultural tool

In this section, I continue with a presentation of a specific cultural tool: *narrative*. The reason is that the narrative genre is commonly used in Swedish early childhood education as means of engaging children in reading and writing (Fast, 2007; Klerfelt, 2007). This is not surprising since narratives through human history have functioned as a tool for the communicative rendering of accumulated experiences to growing generations, memorising and for entertaining (Bruner, 1996; Wertsch, 1998). The narrative genre can therefore be seen as a mediator of culture through times and changes in society. It is culturally specific and differs between oral and literate cultures, but ways of narrating may also differ between smaller groups of societies (Brice Heath, 1983/1996; Olson, 1994). Various forms of narrative genres have developed over time, such as the classical fairy tale, gossip, jokes and stories of everyday events (Säljö, 2011). As an analytical concept, a genre refers to a particular kind of text (oral or written) that represents the world in a distinct way with particular features (Bruner, 1996). An important aspect of literacy, Olson (1994) maintained, is to have awareness of "the evolution of genres and of systematic means for distinguishing and interpreting those different forms"[17] (p. 121).

On an individual level, many researchers emphasise the generic sensemaking function of narrative, for instance, mediating personal experiences or life stories for constructing identities (Wells, 2009). Life stories are defined by Ochs and

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[17] I am aware of the existence of many understandings and definitions of genre; however, since the present thesis only addresses the narrative genre, I refrain from discussing the term further.

Capps (1996) as "verbalized, visualized, and/or embodied framings of a sequence of actual or possible life events" (p. 19) and are usually told in a chronological order, which allows the narrator to hold together otherwise disconnected life events. In this way, the construction of a story becomes a significant mediating tool for communicating the self through time and space (Engel, 1995). The functionalities of narratives are many and fundamental for people. The present thesis narrows the focus to children's storymaking as responses to instructional activities and therefore I will not elaborate further on the line of narrative theory addressing life stories.

According to the Oxford Dictionary, the English word narrative can be traced to late Latin, *narrativus* meaning "telling a story", originating from the verb *narrare*. A narrative implies arranging sequences of events in a coherent (not necessarily chronological) and intelligible order with an introduction and an end. Furthermore, a narrative typically revolves around an emerged conflict/problem that is to be solved by a character in a particular environment (Bruner, 1996). Interestingly, it also originates from *gnarus*, which means "knowing". Thus, etymologically, an aspect of knowing attributes a narrative as organiser of thoughts and as a mediating tool for learning.

Jerome Bruner (2006) made a distinction between what he labelled a paradigmatic and a narrative way of reasoning. The paradigmatic mode is characterised by a logical and mathematical way of thinking, while the narrative mode concerns people's intentional actions and experiences. These two mindsets thus represent different discourses; that is, when the paradigmatic mode operates a more analytical way of speaking is used. The speaker or the writer strives to be as truthful as possible and leave a minimum of scope for interpretation. On the contrary, in narrative discourse, language is more expressive, builds on imagination and emotions (Bruner, 2006) and "allows people to build stories, narratives with explanations, background descriptions and comprehensible coherence" (Säljö, 2005, p. 90, my translation). Narrative discourse leaves a wider scope for interpretation. For young preschool children, interpretation is a matter of an increased understanding of communicative intentionality (Olson, 1994). This implies, as a listener, to understand the relationship between a stated utterance and what is meant by it (the intention of the speaker). Thus, the interpretation of what is said and what is meant implies 'a reading between the lines'. The awareness of different perspectives, that other's beliefs or intentions may differ from my own, often occurs in the

late preschool years and early school years and is fundamental for the development of literacy (for further discussion, see Olson, 1994).

It may appear that the distinction accounted for is dichotomous. However, Bruner (2006) argued that both mindsets provide different possibilities in, for example, organising knowledge and for meaning-making. Thus, the distinction between narrative and paradigmatic ways of thinking is analytical, as in empirical discourse, there is no definite line between the two forms of communication. In a similar vein, Vygotsky (1987) resisted a detachment of the intellectual side of the human mind from its affective side since people have interests, needs and motives that are governed by thoughts in one direction or the other.

The division of the mind is, however, notable in pedagogical practice in many ways, for example in the text genres that children both consume and produce (e.g., stories and factual texts). The paradigmatic way of thinking tends to be emphasised in the curriculum (Bruner, 1996) by the prevalence of scientific use of language and the stress on factual assessable knowledge. What is important here in Bruner's argumentation is the indication of our insufficient knowledge of how narrative ways to think develop in childhood. We know, however, that the understanding of the narrative genre emerges at a young age and that narrative skills increase through participation in social practices. The primary narrative tools are spoken and written language and visual symbolic representations (images or graphics), which in addition may serve as structuring resources.

Structuring resources

How we act in a situation depend on the perceived purpose of the activity and what relevant *structuring resources* are made use of (Lave, 1988; Säljö, 2000). These resources structure the activity, and in this way, they constitute support for our thoughts and performance of actions within the activity (Lave, 1988). The central idea, Lave (1988) asserted, "is that 'the same' activity in different situations derives structuring from, and provides structuring resources for, other activities" (p. 122). It is argued that personal experience constitutes the primary linking resource. A typically open-ended mathematical problem given in preschool may serve as an illustrative example: you have invited six friends to your birthday party, but unfortunately you only have 10 balloons not 12. How do you divide the balloons among your friends? This kind of problem is plausibly a familiar experience for most children. Equipped with various tools,

such as a pen, paper or a digital device, the children are encouraged to produce solutions using numbers, other signs and symbols, which all structure how they take on the task. In this context, you might see solutions of drawn balloons, of which some are divided in half. In another actual situation, during a birthday party, the problem is likely solved differently using other structuring resources, such as assumptions, expectations and knowledge of a balloon's quality (e.g., it loses its function if divided). The stated mathematical problem is the same in the two scenarios; however, experiences derived from other situations come into play and contribute to how the task is solved. Since the children in the first scenario are in a pedagogical setting their previous experience of instructional tasks become most relevant and therefore becomes the structuring resource for solving the problem in an institutional way of mathematical thinking. In the latter scenario, from previous experiences with birthday parties (unhappy friends if the balloons are not shared equally), other solutions are more relevant, for example, only handing out one balloon to each child. In sum, Säljö (2000) stated that structuring resources are an essential part of our learning ability to identify key features of a practice and to act in accordance with these. What becomes a structuring resource is then an empirical question. In Study III, the concept is used in the analysis to delineate what resources the children use in structuring their work on solving the narrative task; the institutional setting, the cultural tools and previous experiences are taken into account.

Intersubjectivity

Intersubjectivity is a generic human feature, as people tend to orient themselves towards others to socially interact. For research with an interactional theoretical perspective, it is important to clarify how intersubjectivity is established between individuals. What the concept refers to is somewhat elusive, characterised by both unconscious assumptions and negotiations, and always contextually specific. In an anthology from 1998, Bråten summarised a number of studies conducted during the seventies, by, for instance, Trevarthen, who illustrates how children begin to develop their communicative skills as infants. In what is referred to as primary intersubjectivity, the infant seemingly unreflectively searches for his/her mother's (caregiver's) attention and the mother in return responds to the child's efforts. This "dyadic state of intersubjectivity" (Rommetveit, 1998, p. 355), or as Linell (2014) put it: the I-thou-relationship, is understood as a circular activity. It is characterised by

emotional interpersonal attunement with sharedness and reciprocal commitment. This form of primary communication is foremost constituted by non-verbal language in terms of facial expressions, gestures and sound-producing movement (Bråten, 1998). Eventually, the interaction tends to expand by the inclusion of objects (Bråten, 1998), such as toys or household items. The shared attention towards an object importantly introduces the child to words and phrases associated with the object. Next, peripheral third parties are presented to the young child, although initially figuring as references in the dyadic constellation (Bråten, 1998; Linell, 2014). This referencing, as it seems, contributes to the child's reflection and understanding of the self-other relation (Bråten, 1998), which is the foundation of intersubjectivity. These initial and crucial communicative steps form the basis for the child's development of interactional skills. By learning the symbolic functioning of gestures, and being introduced to semiotic language, as well as symbolic conventions, the child receives the necessary tools for active participation in various social contexts besides family, for instance, in pedagogical activities (cf. Bruner, 1996; Bråten 1998; Vygotsky, 1987; Wells, 2009).

Importantly, Bråten (1998) pointed out, the characteristics of emergent intersubjectivity accounted for above do not decrease over time; instead they are continuously evoked throughout social life. One demonstrative example (retrieved from Vygotsky, 1987) may be "the attunement of immediacy sharedness" illustrated with a passage from a novel by Tolstoy where the characters Kitty and Levin, during a meeting of declaration of love, wrote to each other using only the initial letter of the words, and yet they understood the message perfectly. How this understanding is achieved "can only be assessed against the background of whatever constitutes the intersubjectively established social reality at the moment of the speech" (Rommetveit, 1974, p. 29).

One presupposition for establishing intersubjectivity of this kind, Rommetveit (1974, 1998) maintained, is the participants' taken-for-granted assumptions of shared experience and knowledge. This assumption is a prerequisite for their orientation and for the possibilities of making sense in a situated context. As the Tolstoy example shows, the taken-for-granted assumption entails a mutual, albeit implicit, agreement of what is meant by what is said (Josephs, 1998; Linell, 2014), or in this case, written. Words, phrases and symbolic gestures must be contextually interpreted by the participants in a similar way, even if they are referring to objects or events outside the situation. Therefore, semiotic tools in some sense require a "stable, publicly agreed

meaning" (Wells, 2007, p. 254). In interaction, however, some expressions (e.g., deictics, such as "here", and "there") are often used, which may cause misinterpretation between the participants. As we know, depending on their social and cultural background, people do not perceive the world in exactly the same way, and consequently they cannot share complete experience or knowledge. For that reason, intersubjectivity can only be partially and temporarily achieved (Linell, 2014; Rommetveit, 1974, 1998). In fact, to attain interaction, the participants must synchronise their attention and perspectives to establish what Rommetveit called *temporarily sufficient intersubjectivity* to enable a continuation of the activity. This implies a frequent (re)negotiation of meaning, thereby "maintaining agreement about the topic and purpose of their talk" (Wells, 2007, p. 253).

When the participants discover a discrepancy in their understanding, that is, having insufficient intersubjectivity, the interaction is exposed to a breakdown or a renegotiation. Empirically discerning misunderstanding, or insufficient intersubjectivity, is possible through a systematic turn-by-turn analysis, identified by the speaker's repair of his or her utterance, in what in Conversation Analysis (CA) is called third-position repair. Schegloff (1992) explained a conversation organisational schema as follows:

> It happens that a speaker of a turn, T1, "releases" it as adequate, and its recipient finds in it no problem that warrants initiating repair in the next turn position. Accordingly, its recipient produces a next turn, T2, sequentially appropriate to his or her understanding of what the speaker of the prior turn was doing in T1 […]. After such meant-to-be-sequentially-appropriate next turns, in what we can term third position […], the speaker of the problematically understood talk – the trouble source – can undertake to address the trouble by engaging in some operation on the source of trouble, that is, the talk in T1. (p. 1303)

The conversation continuation is to a certain extent contingent on the participants' agreement on the speaker's privilege to determine what is meant by what is said, and on the listener to temporarily adjust to the speaker's perspective (Rommetveit, 1985). However, the listener is not completely bound by this agreement, but rather has the liberty to decide which position he or she wants to address in the response (Wells, 2007). In fact, interaction is not all about achieving consensus, as we have different intentions, interests and knowledge that we bring with us into an activity (Linell, 2014). It is, in fact, from these breakdowns that new ideas are born (Rommetveit, 1998) and where

a shift in perspectives and learning may take place. If such a critical event occurs in a pedagogical situation, an opportunity emerges for a teacher to get an understanding of the child or children's knowledge, and thus may further support them in their learning. In the thesis, traces of the participants' spoken or non-verbal turns are scrutinised to indicate whether they succeed or fail to establish temporarily sufficient intersubjectivity to continue the narrating (Study IV).

Scaffolding

Due to its illustrative metaphorical qualities, scaffolding[18] has been widely adopted in pedagogical analyses and discussions, in part having become overused as any kind of 'help', or seen as any teaching strategy (Elbers, Rojas-Drummond & van de Pol, 2013). There is no consensus on the definition within the research field (Howe, 2013; Mercer & Littleton, 2007; van de Pol & Elbers, 2013; Warwick, Mercer & Kershner, 2013). The concept has its origin in Wood, Bruner and Ross' (1976) studies with mothers and their children involved in block construction. The purpose was to identify how the mothers provided the children with support in solving problems and completing the task. This resulted in what the researchers could delineate as six key factors characterising scaffolding: (a) the adult's recruitment of the child (i.e. get the child interested in the task at hand); (b) a reduction in the degrees of freedom (i.e. simplifying the task by reducing alternative ways of performance); (c) direct maintenance (keeping the child motivated, but also encourage to risk next step); (d) marking out critical features (by discovering discrepancies in what the child has produced in relation to the correct production); (e) the control of the child's frustration; and finally (f) the demonstration of a task solution. The scholars clarified the concept in the following manner:

> This scaffolding consists essentially of the adult "controlling" those elements of the task that are initially beyond the learner's capacity, thus permitting him

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[18] The concept of scaffolding is often linked to Vygotsky's concept zone of proximal development (ZPD) to illustrate how instruction can be conducted and thus support a child's learning. As with many of Vygotsky's concepts, the ZPD is subject to vastly different interpretations, and often associated with a rather static relationship between a teacher and a less competent child. In the present thesis, ZPD is deselected since there is a connotation to one-to-one-interaction. Instead, scaffolding is used to understand the teacher's participation in the activities in relation to the child-dyadic interaction and the involved tools.

[or her] to concentrate upon and complete only those elements that are within his [or her] range of competence. (Wood et al., 1976, p. 90)

This controlling requires sensibility and guidance so that the child receives self-supported competence while fulfilling the task (Littleton, 2013). For comparison, a literature review on scaffolding conducted by van de Pol, Volman and Beishuizen in 2010 yielded three areas of characteristics: contingency, fading and the transfer of responsibility. Most central is contingency, which entails increased control when a child fails and the opposite, decreased control when he/she succeeds (van de Pol & Elbers, 2013). In a classroom context, this implies that the teacher in challenging a child or a small group of children must give contingent support by focusing more on their encountered problems than their successes to estimate their understanding of the task. The difficulty lies in finding the balance between the child's understanding and level of challenging task elements. Scaffolding is, from a sociocultural perspective, not regarded as synonymous with any teacher strategy; rather, within a pedagogical situation there is room for negotiation between the teacher and the child/children, as they are assumed to take an active part by responding to and interact with each other, and also with the cultural tools at hand. Eventually, scaffolding would be expected to gradually fade, as it is highly temporary and aimed at transferring the responsibility to the child for taking on the challenge faced (van de Pol & Elbers, 2013).

The concept is not merely useful for discussing the completion of a specific task, but also for developing the child's competence in solving tasks on a higher level of difficulty that are more complex in nature (Wood et al., 1976; Yelland & Masters, 2007). Research with an interest in scaffolding requires an analysis of language use, and therefore, the concept "extends to the language and symbols that the participants use in their efforts to create meaning and mutual understanding" (Elbers, Rojas-Drummond & van de Pol, 2013, p. 1). The scaffolding approach, Daniels (2001) critically argued, tends to "concentrate rather more on distribution across people rather than artefacts or things" (p. 107). However, more recently, scaffolding has been further discussed in the context of the technology-enhanced classroom (e.g., Englert et al., 2004; Warwick et al., 2013; Yelland & Masters, 2007). In the light of this development, scaffolding may require some further elaboration to be useful in research on contemporary pedagogical practices (Littleton, 2013). Scaffolding is a question of the allocation of work; therefore, in the thesis, the analysis is focusing on how the teachers support the children, by instruction, asking questions or acting

in ways that challenge their reasoning and acting while handling the technologies.

Creativity, aesthetic experience and judgements

Creativity is a frequently and variously defined concept, and one commonly associated with artistic creativity at a professional level. From a sociocultural theoretical outset, however, creativity is considered an important part of people's everyday lives depending on how the cultural tools are used (Lindqvist, 2003; Lobman, 2010). In the first line of his text *Imagination and Creativity in Childhood*, Vygotsky (2004) stated: "Any human act that gives rise to something new is referred to as a creative act, regardless whether what is created is a physical object or some mental or emotional construct that lives within the person who created it and is known only to him" (p. 7). The very source of material for what 'new' a person creates is found in his/her previous experience. From this standpoint, Vygotsky (2004) further declared: "It is this ability to combine elements to produce a structure, to combine the old in new ways that is the basis of creativity" (p. 12). In young children, this creative process is primarily shown in their play and in their narratives in which perceived objects or events from, for example, the routines of family life, along with associated emotions are reused and remixed to construct something imaginatively new that belongs (initially) only to the child (Vygotsky, 2004). Based on this premise, it is possible to argue that when children participate in collaborative activities that enable them to creatively engage in the combining of elements and different representational systems (Siraj-Blatchford & Siraj-Blatchford, 2011), opportunities for valuable learning may occur (Lobman, 2010). That is, by interacting, children gain access to the experience of others, which implies an increased number of sources that provide opportunities for sensemaking. The reasoning thus far contrasts the traditional view of learning as a reproduction of something observed or heard, or as repetition of behavioural patterns that are created elsewhere (Lindqvist, 2003). The concept of creativity is employed in the thesis to understand how the children combine elements from their previous experience into new narratives.

How then can the seemingly vital concept of experience be understood? An explanatory answer may be found in Dewey's (1934/1980) philosophy on experience. According to him, people find themselves in a continuous flow of experience. Beginnings and endings are on occasion distinguishable; however,

experience is constantly interrupted and superseded. Therefore, they appear to us to be transitory. What we perceive as *an* experience that we remember in particular differs from experience in general by 'standing out' from what has happened earlier and happens later. That is, it consists of parts but is subject to their merger into a well-defined whole that is possible to name from something characterizing the experience, such as "that meal" (see Dewey, 1934/1980, for further explanation). Dewey (1934/1980) conceptualises an experience as follows:

> We have *an* experience when the material experienced runs its course to fulfillment. Then and then only is it integrated within and demarcated in the general stream of experience from other experiences. A piece of work is finished in a way that is satisfactory; a problem receives its solution; a game is played through; a situation, whether that of eating a meal, playing a game of chess, carrying on a conversation, writing a book, or taking part in a political campaign, is so rounded out that its close is a consummation and not a cessation. (p. 36f.)

This reasoning suggests a progression in terms of the continuation of actions and their consequences, which includes an anticipation of what is to come and a fulfilling consummation of the whole experience. The exemplified situations above (i.e. playing a game, carrying on a conversation, writing a book) presuppose social interaction and encompass intellectual, practical and material dimensions. Without doubt, people's actions herein thus involve both their cognition, but also senses, such as sight and hearing, values, judgements, enjoyment and other emotions (Dewey, 1934/1980). In this respect, an experience has aesthetic qualities. The concept of *aesthetic* originates from the Greek word *aisthē̄ta,* which means "perceptible things" (Oxford Dictionary), although, in the literature the concept is defined and used in various ways. The present thesis is based on the assumption that a storymaking activity may well constitute an aesthetic experience, wherein the participants evaluate/judge the visual art and/or other features of their creative work in accordance with appreciation and taste. In Study IV, the analytical focus is directed towards aesthetic judgements. Of special interest are those moments when the participants express an aesthetic judgement that mediates the anticipation of coming action or the fulfilment of the activity, and what consequences these utterances have for continuing activity.

Against this background, providing children opportunities for creative and aesthetic activities in pedagogical practices, Lobman (2010) maintained, is to

prepare them to be critical and flexible thinkers who can navigate in a changing world. Digital technologies are an essential part of contemporary rapid changes, offering additional tools for multiple ways of combining sign systems. Whether contemporary technologies lead to better learning is less meaningful to study, from this point of view; higher on the agenda is to increase the understanding of how people creatively use technologies and how these may contribute to an aesthetic experience.

Summary

To summarise the presentation and discussion of the theoretical framework for this study, this theoretical position, like every position, has implications for how a research object is delimited. From a sociocultural perspective, when examining changing early literacy practices in which digital technologies constitute an increasingly integral part, implies a unit of analysis that is directed towards technology-mediated activities where the participants' interactions are observable. The choice is grounded in the epistemological view of learning, as first taking place in social interaction, and further to be contingent on the *in situ* context, which encompasses available cultural tools, the institutional setting and the participants' actions. The most significant mediational tool for communication is language (Säljö, 2000). On a daily basis, we creatively use semiotic and symbolic linguistic actions when interacting with others, and frequently we do so within the communicative genre of narrative. The verbal, written or visualised narrative mode constitutes an essential mediator for sensemaking in everyday life (Bruner, 1996). Moreover, it regularly serves as a means of engaging preschool class children in their early reading and writing. The premise is furthermore that, to successfully construct collaborative narrative activities, the participant must achieve temporarily sufficient intersubjectivity, that is the coordination of their perspectives, and that the teachers are critical to scaffold children taking on challenges faced.

Chapter 3 Research on narrative and early childhood literacy

Introduction

To be able to contribute to increasing knowledge in a field of research, it is crucial, prior to formulating research questions, to undertake a review of previous literature by, "set[ting] out what the key issues are", "reporting key methodologies", and thereafter to "identif[y] gaps that need to be plugged in the field" (Cohen, Manison & Morrison, 2011, p. 121). The intention of this chapter is to undertake this mapping. Locating a study in a particular field can prove to be problematic since the object of research may intersect several areas. Since the unit of analysis in the present case consists of instructed technology-mediated storymaking activities within the preschool class, this may potentially imply addressing the broad fields of narrative, classroom dialogue, digital technology in pedagogical practice and early childhood literacy. However, to avoid becoming too extensive, and thus hamper the identification of the key issues, it is important to narrow a review by selecting the most relevant studies for the research interest. For the present thesis, this means that two research fields are of primary concern: first, early childhood literacy, motivated by the urgent need to investigate young children's literacy experience in relation to the rapid technological development that substantially alters their everyday lives. An increasing number of studies in the field recognise these changing conditions, both in and out of school (Larson & Marsh, 2013). For the purpose of delimiting this overview, only studies encompassing early childhood education are included. Second, since the thesis takes a narrative perspective on literacy, literature in the field focusing on children's narration in pedagogical practices is also reviewed.

Figure 1. The two reviewed research fields in interplay with the topic of the present thesis.

The literature search for this overview was completed in two rounds. The first was conducted within the framework of my licentiate thesis (see, Skantz Åberg, 2014). This overview has been supplemented with later literature in a second search, and the chapter is revised to form a coherent whole. Three databases, *Education Research Complete*, *ERIC* and *SwePub*, provided the basis for the search allowing access to the most relevant national and international journals (14 in total), book chapters and doctoral theses in the fields mentioned above. The search was limited to the time span 2005–2016, as there are ample reviews of research up to this period, on which the present overview partly builds upon (e.g., Burnett, 2010; Labbo & Reinking, 2003; Lankshear & Knobel, 2003). I return to these previous reviews below. Research within the addressed narrative field is not included in the mentioned reviews; therefore, a separate search has been conducted without time limitations. One important journal, *Nordic Journal of Digital Literacy* is not included in the databases and has therefore been supplementarily reviewed.

The following keywords were used in various constellations: *early childhood*, *preschool*, *kindergarten*, *technolog**, *ICT*, *digital**, *computer*, *litera**, *narrat** and *story**; and in SwePub the Swedish words: *förskol**, *teknologi*, *digital**, *dator*, *IKT*, *literac**, *läs**, *skriv** and *berätt**. Truncation was used to broaden the search results. Delimitations were set up to full-text and peer-reviewed work. The search generated a large quantity of studies, and as a consequence, a manual reading through of the abstracts was necessary to select the most relevant texts. In the selection process, only empirical studies of early-year literacy classrooms were included. Excluded were studies of e-storybook reading[19] and studies based on

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[19] A distinct line of research within the early childhood literacy field includes studies of e-storybook reading. For the present thesis these are of peripheral relevance.

interviews with teachers and children about, for example, their perception of digital technologies in classrooms. In addition, literature on special education was not included in the review. Thus, this overview is based on consideration of both methodology and content. Remaining from the selection process was 22 articles, eight doctoral theses, three book chapters. To yield a broader view, the overview was complemented by other central texts within the field of literacy, and the field of children's narrative in pedagogical practice. These texts are frequently referred to in the corpus of the already selected studies. The overarching ambition of the overview is to bring forth key issues and ideas that engage researchers within the two fields, to locate knowledge gaps that the thesis will contribute to fill.

The chapter is structured in the following way: initially, literature that addresses narrative as a mediating tool for children's literacy development and children's narration in pedagogical practices is accounted for. Then a historical presentation of research within the broad literacy field is given, albeit very briefly. Finally, a selection of recent studies focusing on the use of digital technologies in early childhood education is reviewed.

Narrative as a vehicle to develop literacy

Since the 1970s, research on children's narratives has developed into a vast field, foremost conducted within the disciplines of psychology and linguistics, and with a predominance of analytical focus on formal narrative structure[20] (Nicolopoulou, 1997). What structures are of interest depend on the researcher's definition of narrative; for example, viewing narratives as sequences of events lead to a focus on temporality (Klerfelt, 2007). Given that these kinds of formalist studies have contributed with insights into the generic narrative structure, and to children's development of linguistic skills in relation to narration, they have practically disregarded "the ways that children *use* narrative for diverse modes of symbolic action", Nicolopoulou argued (1997, p. 179, italics in original). Meanwhile, the sociolinguists Labov and Waletsky (referred to in Nicolopoulou, 1997) elaborated on an analytical framework, based on adults' narratives of personal experience, that aimed at finding the invariant narrative units to reveal a universal structure; they also advanced their

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[20] The intention of this section is not to give an extensive historical presentation of narrative reconceptualisation, but to show how narration is an important tool for literacy development. For a substantial historical overview of narrative research, see e.g. Nicolopoulou (1997) and Klerfelt (2007).

work by recognising narration as a socially interactive activity situated in a context (Nicolopoulou, 1997). Researchers within the sociocultural tradition have found the framework useful for children's production as well, although it is limited if interested in analysing meaning (Nicolopoulou, 1997). This framework has advantages from a linguistic perspective, Bruner (1996) maintained: however, it cannot explain a narrative as a tool for thought (see the theory chapter). That this perspective does not provide conceptual tools for analysing meaning, together with Bruner's claim, contribute to the decision to not build upon Labov and Waletsky's analytical framework in the present thesis. However, as Nicolopoulou (2011) suggested, to understand children's symbolic actions, through their collaborative narration, an analysis needs to integrate both narrative structure and content, that is, the sequential events and combining of elements, such as setting and characters, and the situated context in which the narrative is created. An in-depth analysis of the relation between the participating children's finished products and their working process was done in Study II, while in the other studies the process was foregrounded and the product remained in the background.

Why then is it important to study children as they create narratives? First, it gives us important information about children's social and cultural experience and beliefs (Khimji & Maunder, 2012), and their conceptions of the world (Nicolopoulou, 2011). Second, when children are engaged in interactive narrative activities, opportunities likely emerge to develop meta-language skills[21] (cf. Letnes, 2014). Decades of research have shown the value of oral narration for supporting the advancement of literacy (Theobald, 2016). A seminal contribution to this understanding was made by Gordon Wells (2009) in an English longitudinal study. Wells' research team followed 32 children from the age of 15 months to 12 years in their home, in preschool and in their further transition into compulsory school, with the purpose of studying the cultural and linguistic differences in the children's social environments and investigating whether there is a relation between these differences and later school achievements. The main findings strongly indicate that the variation in the achieved level of reading and writing skills at the age of five remained the same five years later. What was significant was how the five-year olds understood literacy and what support they received from home; the most successful

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[21] Although researchers primarily have been interested in studying linguistic actions associated with narrative, it should be pointed out that narratives often involve non-verbal means (Wright, 2011), which will also be discussed later in the thesis.

children were those who often could listen to stories, told or read by the parents (Wells, 2009). It is argued that these social experiences eventually lead to a child's independent storytelling (also see Brice Heath, 1983/1996; Fast, 2007).

How can narrative activities specifically provide a basis for evolving literacy? Reading and listening to stories generate new experience that broadens the child's world, and simultaneously, the story becomes a means of making sense of already perceived experience. In books, the encountered experiences are represented in an abstract way – through written language (Wells, 2009). This implies that, since narratives are foremost created with semiotic language (both spoken and written), Wells (2009, p. 220) argued, children eventually discover that language constitutes a "symbolic mode of representation". This is a crucial step in understanding the alphabetic writing system that is based on symbolization of speech sounds. The interpretive power in these activities presupposes a speaker and a listener involved with a specific narrative discourse that deals with human intention (Bruner, 2006). This discourse is characterised by attitudes, values and emotions, which are all aspects included in DeSeCo's concept of literacy (OECD, 2005). Moreover, through the story, children gain an increased vocabulary that is considered essential for good reading comprehension.

Children also encounter the formal aspects of narratives, often in a straightforward manner, that is, with linear event sequences that are structured in the introduction, middle and end, around a problem or a conflict that leads to a solution (Bruner, 1996). Familiarising themselves with this structure supports their own storymaking; however, young children need assistance to varying degrees in learning this art by means of selecting and arranging events to a coherent and intelligible story (Wells, 2009). This is one critical pedagogical assignment of early childhood education (Bruner, 1996).

Children's narration in pedagogical practices

As a cultural tool, the narrative genre serves multiple purposes in pedagogical pratices; among other things, it is regarded as a bridge to early literacy, as discussed above. From this point of departure, contemporary studies have resulted in several lines of research, such as e-book reading (e.g., Hoffman & Paciga, 2014), children's comprehension and retelling of stories (e.g. Pihl, Peterson & Pramling, 2017) and narrative and play (e.g. Wohlwend, 2015). However, as discussed in the introduction section, even if research on children's

literacy development through narrating is an expanding field, fine-grained analyses of the interactional aspects of children's storymaking are still scarce. It is well documented that from an early age children to a greater or lesser extent experience family stories, and in interaction with peers they encounter and use both fictional and non-fictional stories mediated by their experience from different cultural ecologies in which they participate (Fast, 2007; Khimji & Maunder, 2012; Marsh, 2005, 2010), but what strategies do they employ when narrating?

In an ethnomethodological study conducted in a school preparatory playground in Australia, Theobald (2016) video observed 24 children aged 4.5 to 5.5 years when participating in spontaneous storytelling. The analytical focus was directed towards how the children develop narrative competence[22] in a joint project, through actions as tellers and recipients. The findings show that invoked by the peer culture *in situ*, the children link their own stories into a common topic, stories they justify in different ways. To maintain the given storyteller floor, the narrator uses affective and linguistic markers, such as 'and' and 'too', and further includes new events to expand the topic (Theobald, 2016, p. 99). Moreover, to increase the listeners' interest, the narrative can be enhanced by an animated voice, facial expressions and other physical actions. The recipient's response is shown crucial for the storymaking trajectory; by asking questions, it is maintained, but in the absence of response, the teller is required to reinforce her/his utterance through dramatic effects (Theobald, 2016). From a previously conducted Dutch case study of four six-year-old children in a pedagogical setting during collaborative work with writing a story, van Oers (2007) re-analysed the videotaped data material with an interest in the children's use of their narrative competence. He defined narrative competence as the ability to "(re)construct and use textual representations for the purpose of clarifying meaning to oneself or others in the context of some sociocultural activity", and "It includes the ability to produce a system of (spoken and written) utterances (meant to be coherent)" (van Oers, 2007, p. 304). An essential aspect of narrative competence according to van Oers, as Theobald suggested as well, is the ability to position oneself in the listener's perspective. Similar to Theobald, the findings show that the children narrate both verbally and in writing by adding predicates that extend or modify the topic in an

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[22] The concept of competence is mentioned at times in the thesis text; however, this term is used with reference to other researchers. While conducting my study, I have come to understand its complexity and therefore have chosen to avoid the concept.

associative manner or from a stylistic point of view. The proposed predicates are subject to negotiation about whether they are consistent with the plot (van Oers, 2007). By studying how these narrative utterances unfold, van Oers (2007) maintained that a possibility opens up to assess children's increased knowing and assist their further learning.

Beside linguistic and bodily means, children employ other ways to narrate. Several studies show that commonly children's storymaking is accompanied by drawing in which colour, form and composition are used to express different meaning (see e.g., Coates & Coates, 2006; Holm Hopperstad, 2008; Wright, 2011; Änggård, 2005). With an ethnographic approach, Änggård (2005) investigated how 36 children in two Swedish preschools act and make sense during image-driven storymaking activities. Among the 500 collected images, she found, however, that they contained few narrative elements, while the aesthetic aspects seemed superordinate to the plot. This is explained by the children's insufficient mastering of the genre (Änggård, 2005). Aesthetics also seemed important for the five- to six-year-old children in Holm Hopperstad's (2008) study conducted in a Norwegian primary school. She analysed the relation between the children's engagement in visual sign making and their peer interaction and found how the children's orientation towards each other's drawings was primarily to aesthetically judge the work of their peers.

Eventually, in pedagogical practice, the function of visual language decreases in favour of written symbols (Klerfelt, 2007). The first written texts young children produce are often structured with a short initial clause or orientation of the topic, followed by sequences of events linked by additive conjunctions, such as *and then* or *and so* (Taube, 2011, cf. the findings of Theobald above). When it comes to narrative content, it is personal, in the sense of being about experienced everyday events or invented (imaginary) ones (Klerfelt, 2007; Taube, 2011).

The research reported thus far shows an overall general view of the child as a competent agent; however, there are also indications that point to children as being in need of support to master narration. What does research then tell us about how children's appropriation of narrative skills can be supported by teachers? First, the pedagogical practice should be thematically organised, with playful activities where narration, writing and reading serve as meaningful communicative and cognitive tools (van Oers, 2007; Vygotsky, 1978). Such an approach acknowledges children's use of cultural experience (e.g. Khimji & Maunders, 2012; Fast, 2007).

Second, by organising interactive narrative activities (involving both speakers and listeners), or being responsive when spontaneous occasions occur, opportunities emerge for the teacher to scaffold children's own verbal stories both cognitively and affectively. This may be exemplified by an empirical study conducted in two Nordic preschools on 13 children's (one to four years of age) appropriation of the skill to link narrative elements (Pramling & Eriksen Ødegaard, 2011). The two activities analysed in the study consisted of one fictional story that was introduced by a teacher and one everyday story spontaneously initiated by a child at the breakfast table. In picking up the children's fragmentary utterances, by asking clarifying questions, in means of, asking who participated, what happened, where and when the event took place, and additionally giving suggestions of new elements, the teachers scaffolded the children in extending the stories. These questions, Pramling and Eriksen Ødegaard (2011) suggested, directed the children's attention to key narrative components, such as agent(s), actions and events, setting, and the time aspect (cf. Bruner, 1996). In addition, "through providing contextual ties (backwards and forwards) and putting the focus on the narrative genre (form: how it begins, develops and ends)", the teacher scaffolds the creation of a coherent story (Pramling & Eriksen Ødegaard, 2011, p. 30, see also van Oers, 2007, regarding the use of conjunctions). Posing demanding questions and urging children to reflect during the narrative process support children to use generalisations and categorisations, and thus develop higher-order thinking (Sandvik, Smørdal & Østerud, 2012).

Popular-cultural media as a source for children's narrative

Popular-cultural media encompasses a large part of most western children's everyday lives and constitutes a source for their narratives and play. In her ethnographic study of seven children's encounters with literacy events in their home, preschool and school, Fast (2007) showed that experiences from mass-produced toys, books, films, television, computer games and mobile applications form a common platform and a shared understanding of signs, symbols, images, narrative structure and thematic, for example regarding good and evil (cf. Klerfelt, 2007; Marsh et al., 2005, 2010; Urbach & Eckhoff, 2012; Änggård, 2005). Decontextualised elements from these media texts are not solely imitated, but rather modified and remixed by the children to suit their

purposes (Fast, 2007; Nicolopoulou, 2011; Urbach & Eckhoff, 2012). This intertextuality is well described in many of Dyson's writings (2001, 2003, 2010), deriving from her ethnographic studies on Afro-American children in the first school year. In one study, the children were instructed to write a story about a freely chosen topic, which resulted in texts involving familiar references, such as songs from the radio, films, sports and so forth (Dyson, 2003). By this open-ended instruction, the children could meet their new pedagogical practice and the expectations of literacy with their own previous cultural knowledge, which proved to be successful (Dyson, 2003). Similar findings are reported by Klerfelt (2007), but from a preschool perspective. Intertextuality between media texts thus seems to offer rich material for sensemaking, play, drawing and literacy activities.

One should keep in mind, however, that popular-cultural media is a much-debated subject, in terms of low and high culture, and gender stereotypes. An example of a teacher's negative attitude towards the use of popular media in the classroom is shown in a case study of a boy who was skilled in oral telling and, in his stories, included many known elements derived from films (Urbach & Eckhoff, 2012). The teacher prevented the boy from using these elements since the narrative content was deemed negatively affected through their contribution to a simple adding of characters and events. The limiting instruction, however, resulted in shorter stories, and they did not reflect any emotions or atmospheres. Urbach and Eckhoff (2012) suggested that the teacher's decision was a consequence of the neglecting of popular media as a tool for narrating. The teachers in Fast's (2007) study based their reluctance to utilise the potentials of children's experience and knowledge gained outside preschool and school on a democracy and equality thought. The pedagogical practice was seen by them as a neutral arena offering the same opportunities to everyone (Fast, 2007).

Now, I proceed to introduce how the broad research field of literacy has changed over time, and thereafter provide an overview of the early childhood literacy field.

The concept of literacy: From individual reading to social practice

The concept of literacy is subject to a continuous public debate, arguably contingent on prevailing changes in society, but may in addition be traced to

the diversified nature of the research field consisting of, for instance, the disciplines of anthropology, sociology, psychology, pedagogy and linguistics. This diversity represents different interests, which are all based on various assumptions of what reading and writing imply for human thinking and learning, on both societal and individual levels (for a critical discussion of these assumptions, see Olson, 1994). Historically, two main lines of literacy research are possible to distinguish: a cognitively and a socioculturally oriented one. In the following, a brief description of how the concept has changed over time is presented, taking into account practices of both adults and children and what the redefinition means for education.

During the first half of the 20th century, behaviourist psychology dominated research with an interest in foremost reading behaviour (Gillen & Hall, 2013). During this period, a child's reading ability was considered biologically conditioned. The cognitive maturation for learning how to read was assumed to be reached at the age of seven. This view led to the introduction of the concept reading readiness, which became the dominating notion for decades thereafter (Gillen & Hall, 2013). No uniform definition of what counted as reading existed, but this term usually implied an instrumental mastering of technical skills. Ever since the 1840s reading instruction has been about teaching the phoneme-grapheme relation without a particular emphasis on reading comprehension (Resnick & Resnick, 1977). Critical voices against the prevailing teaching methods were raised; both researchers and educators in Europe and the United States made reform efforts by introducing child-centred teaching, stressing the importance of meaningful learning. Yet, considerable focus was placed on standardised testing of achieved reading skills and the development of systematic and reinforcing instruction (Resnick & Resnick, 1977).

Subsequently, as a reaction to behaviourism, new disciplines in the form of cognitive psychology became influential in research, especially through the work of Jean Piaget. He contributed to the changing view of the child as active, rather than passive, in constructing his/her own knowledge. Despite the impact Piaget had in early education, reading and writing were generally still conceived of as a matter of context-free technology that progress in a linear universal way. However, after the Second World War, societies were in need of workers with more advanced skills, which eventually led to researchers' recognition of the complexity of reading, and therefore started to investigate the functionality of people's reading and writing activities in social environments (Gillen & Hall,

2013). One of these researchers was Mary Clay, whose important work in 1966 generated new insight into young children's literacy development. She studied their engagement with books, reading and writing activities in natural settings, and showed how they increasingly were involved in such activities prior to entering school. Clay introduced the notion of emergent literacy, which refers to "the 'little by little' accumulation of early knowledge upon which the child will build when he [or she] enters formal instruction" (Clay, 1991, p. 44). For researchers in this tradition, the concept covers a broader understanding of children's early literacy involvement than traditionally. Yet, Clay's writing has its origin in cognitive psychology through its image of the child's solitary acquiring of its own knowledge in a continuous progress (Razfar & Gutiérrez, 2013). This growth direction, Björklund (2008) argued, brings to mind something that is to develop into something else predetermined, thus suggesting a view of the child as 'becoming' a literate person, rather than a 'being' in the sense of using available resources. For this reason, I find the notion of emergent literacy problematic, and as a consequence the term is not used in the present thesis. Nevertheless, Clay's discovery contributed to questioning the predominant concept of reading readiness as well as to that empirical studies on children's early writing began gaining ground, which opened up for a broader approach to young children's text production.

During the 1960s and onwards, a discussion emerged, resulting in what is called The Great Divide that concerned literacy's role in oral and literate cultures. The main representatives of the perception that the writing system as such constitutes a decisive factor in the development of cognition, Goody and Watt (1963) analysed historical texts and proposed a hypothesis of a causal link between literacy, rationality, syllogistic reasoning and the level of societal development. However, reactions to their conclusion arosed, for instance, through the movement of New Literacy Studies (NLS) that "has its origins in the collapse of the old 'oral culture-literate culture' contrast" (Gee, 2008, p. 67). That is, NLS rejected Goody's assumption of literacy as 'autonomous', arguing that appropriated skills or concepts do not derive from some inherent qualities of literacy, existing independent of context (Street, 1984). Early seminal work within NLS is, for example, the studies conducted by Scribner and Cole in *The Psychology of Literacy* (1981). Their anthropological research[23] on the literacy

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[23] Their research builds on Vygotsky and Luria's previous ethnographic work of people in central Asia.

practices of the Vai people in Liberia serves as a paradigm shift by, on the one hand questioning the notion that literacy alone could contribute to higher cognitive development and changes in society, and on the other hand, stating that literacy goes beyond the mere individual ability to read and write, acknowledging the importance of the social and cultural environment. Thus, Scribner and Cole did not accept Goody and Watt's causality hypothesis. Instead, they argued that what enables higher cognitive development is the formal school discourse and instruction. Put differently, it is the institutional way of speaking and writing that is crucial for, for example, the development of metacognition. From their findings, Scribner and Cole (1981) began to address literacy as a goal-oriented communicative practice that involves tools. Thus, literacy practice, they argued, consists of "three components: technology, knowledge and skills" (p. 236).

How the prevailing literacy discourse in education also may constitute obstacles for children's academic success is well described in Shirley Brice Heath's (1983/1996) classic work, *Ways with Words*. She undertook an ethnographic study of literacy practices in three different communities in the United States. The aim was to investigate children's socialisation into language in their home. Her findings show that the children's communicative ways varied depending on interactional pattern including language habits and attitudes towards literacy in the families. The adults' way of addressing the children and their practicing of reading and writing activities as part of everyday life was a result of the fact that "their communities had different social legacies and ways of behaving in face-to-face interaction" (Brice Heath, 1983/1996, p. 11). As a consequence, the three social and cultural contexts generated different literacy experiences for the children and in encounters with the school these experiences were evaluated in strikingly different ways, Brice Heath (1983/1996) showed. For example, the Trackton children's skill to narrate was not valued as highly as the Roadville and Townspeople children's ability to read and write. Thus, their social and cultural experiences better matched the school structure and expectations. With these findings, the study contributes to illuminating the very existence of many different literacy practices and how school privileges some of these.

Literacy practices and literacy events

NLS represents a new[24] view of literacies as multiple, "varying according to time and space, but also contested in relations of power", text and identity (Street, 2003, p. 77). The notion of multiple literacies implies various meaning-making practices embedded in historical, social and cultural contexts in which they intentionally are constituted and altered, and thereby are ideological (Street, 1984, 2003). From this position, Street makes an important distinction between literacy practices and literacy events. A similar remark was made by David Barton (2007) who stated, "Together events and practices are the two basic units of analysis of the social activity of literacy" (p. 147). Street (2003) considered literacy practices as linked "to something broader of a cultural and social kind" (p. 78). For Barton, Hamilton and Ivanic (2000), the unit of literacy practice is "a powerful way of conceptualising the link between the activities of reading and writing and the social structures in which they are embedded" (p. 7). In other words, literacy practices are "the general cultural ways of utilizing literacy which people draw upon in a literacy event" (Barton, 2007, p. 147). These events are by Barton et al. (2000) and Barton (2007) defined as delimited, observable and repeated activities deriving from current literacy practice. The definition provided by Brice Heath (1983/1996) seems broader, in that an event may constitute any occasion in sociocultural practices that involve ways with written words in one way or another. NLS thus acknowledged that people are communicating with written words as forms of language, but at the same time emphasises the impossibility to ignore other semiotic systems, such as non-verbal images and symbols, objects and tools that are integrated in human practices for "thinking, believing, knowing, acting, interacting, valuing, and feeling" (Gee, 2000, p. 30).

For both research and education, the distinction between literacy practice and event becomes helpful to identify a functional unit of analysis. However, Street (2003) pointed out that the key question remains how to relate and conceptualise the shift between the observable events and the broader social and cultural practice of which they are part. This issue is especially interesting considering that we know, through a few studies, how children on an everyday basis participate in literacy events where digital technologies are involved, and how they seem to use these experiences across formal as well as informal contexts (cf. Fast, 2007; Klerfelt, 2007; Marsh, 2005; also see further down for

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[24] I will return to what the 'new' implies further down.

more examples). In the present thesis, neither this shift, nor the on-going literacy practices in the two participating preschool classes are of focal interest. Rather, the analysis concentrates on particular selected events.

Multiliteracies, multimodality and new literacies in the digital era

Radical social, economic and technological changes in Western societies during the 1990s and onwards, resulting in increasing globalisation, prompted a group of educators and researchers, the New London Group[25], to gather to discuss literacy pedagogy in relation to society's new demands for future citizens. The group's work led to the publishing of an attentive article in 1996 in which they launched the term 'pedagogy of multiliteracies,' as an expansion of the NLS concept multiple literacies and proclaimed a new pedagogy with a curriculum subjected to address linguistic, social and cultural diversity within education (The New London Group, 1996). As mentioned above, the changing conditions are also due to the advent of digital technologies, which bring new possibilities for communicating with multiple modes (Cope & Kalantzis, 2009). The pedagogy of multiliteracies promotes active and creative use of all these accessible modes and materials in the process of designing meaning (Cope & Kalantzis, 2009; The New London Group, 1996). Members of the group have further developed some of these ideas with a focus on meaning-making and less emphasis on social aspects.

With a multimodal approach to digitally produced texts, "a linguistic theory cannot provide full account of what literacy does or is", Kress (2003, p. 35) claimed, since these texts usually consist of more than language in a strict sense. This implies that the precedence of language is reduced since "with digital texts, meanings are often constructed and interpreted through complex combinations of still and moving images, icons, words, screen layout, colours and sounds" (Flewitt, 2013, p. 295). An approach that accounts for the meaning of signs and the affordances of different modes, according to the proponents of this tradition, thus requires a social semiotic theory (Flewitt, 2013; Kress, 2003). The theory core concepts are the signifier (e.g. word, image) and the signified (the object being represented). For example, the written or orally uttered word tree

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[25] The New London group consisted of 10 educators and researcher who met in New London, New Hampshire, in the United States, to discuss their concern for the state of literacy pedagogy (The New London Group, 1996). They represented disciplines such as education, sociology and linguistics.

constitutes a signifier, being nothing but a form, although "with potentials for becoming sign" (Kress, 2003, p. 38). It then requires active meaning-making to 'fill' the word tree with content, which is often done based on prior experience of that word and the situational conditions (Kress, 2003). Signs are made and communicated with the use of available modes, which each offer different meaning potentials, based on the various principles and materiality to which they are subject. Differences in the intrinsic quality of the modes entail difficulties for the direct transfer of meaning from one mode to another (Mills, 2011; cf. Kress, 2003, who makes a distinction between transformation and transduction). According to the multimodal approach and semiotic theory, it is in these discrepant sign-making processes that learning takes place.

A common issue for the representatives of the position presented here is the diminishing role ascribed to screen-based written language in favour of the image (Flewitt, 2013; Kress, 2003). In her study of what role writing and image play in students' digital text production and reading, Jewitt (2005) noted how the students prefer to use the image before writing and that the variation in the spatial arrangements on the screen contribute to knowledge and practice of reading and writing. However, some researchers express themselves in milder terms by claiming that, for instance, speech and writing are still necessary but not sufficient for children's ways of making meaning with digital technologies (Mills, 2011).

The metaphor 'new' in new literacies is used by researchers from different points of departure, as Lankshear and Knobel (2011) pointed out; they discern two distinctive approaches: the paradigmatic idea of new and what they call the ontological sense of new. The paradigmatic represents a new alternative view of literacy as social activity in relation to previous traditional reading research (proponents such as Street and Gee represent this view according to Lankshear and Knobel). The researchers' ontological conception of new refers more to the nature of literacies. That is, new literacies consist of different "technological stuff" than considered in traditional literacies such as "screens and pixels rather than paper", and further "ethos stuff", which refers to "different kinds of social and cultural relations" that prompt "different kinds of priorities and values" (Lankshear & Knobel, 2011, p. 29). This stuff is then mutually contingent and is integral in social learning. In this thesis, I do not devote myself further to the distinction of new as it is defined by Lankshear and Knobel since the new now can be regarded as contemporary. Instead I continue with a review of the literature that particularly focuses on early childhood literacy education. This

branch follows the historical path of the broader literacy field, although the literature is narrowed down to studies that include digital technologies.

Early childhood literacy and digital technologies

In the international literature, three overviews – surveying research trends within the field of early childhood literacy and digital technologies – are frequently referred to. The first overview was conducted by Labbo and Reinking (2003) and maps the period of 1960 to 2002. The second partly overlaps with the previous and was written by Lankshear and Knobel (2003), who review studies made between 1999 and 2002. The third covers the years between 2003 and 2009, focusing only on early education, which encompasses children aged 0–8 years (Burnett, 2010). Both Burnett (2010) and Lankshear and Knobel (2003) emphasised that little research has been conducted in the area, which fortunately has seemed to change in more recent years. It also must be noted that the nature of literacy practices is rapidly changing due to the technological evolution, and consequently, it is difficult to provide a fair and up-to-date picture (Lankshear & Knobel, 2003). Nevertheless, Burnett's identification of three indistinct categories of studies, which position technology differently depending on the underlying assumptions of literacy, is useful. The present overview is organised in accordance with the partly overlapping categories: the technology as a deliverer of literacy, a place for interaction around text and a medium for sensemaking.

Technology as a deliverer of literacy

Most studies conducted within the field have hitherto predominantly reflected a psychological-cognitive model of literacy (Burnett, 2010; Lankshear & Knobel, 2003). This implies that the studies are based on assumptions of practices associated with print-based models of reading or writing, and from the premise that the technologies themselves transfer literacy. According to Burnett (2010), the research interest has primarily been directed towards the learning outcome rather than to the pedagogical practice. This backdrop builds on a view of technology as a deliverer of literacy.

Research during the 1980s and the 1990s was influenced by educational trends, as well as commercial and political interests (Labbo & Reinking, 2003). In early literacy education, the still-prevailing readiness approach implied a use

of 'skill and drill' software that aimed to enhance phonics instruction; later the entrance of the internet lead to broadening the conception of literacy as contingent on contextual factors (Labbo & Reinking, 2003). This pedagogy along with technological development influenced research methodology, which brought a shift from effect studies to more naturalistic methods, such as ethnographic studies. The selected studies in Labbo and Reinking's (2003) overview provide considerable evidence that certain software support children's phonological abilities. However, they report mixed results regarding young children's use of word processors, although the overall picture shows their benefits.

Unfortunately, Lankshear and Knobel stated from their overview in 2003 that what is typically still the object of study is children's abilities to handle conventional letters or print texts, rather than investigating how multimodal texts are created. This trend follows into Burnett's overview; the majority of the 36 including studies, 23, is placed in this first category, and they investigate inter alia the impact of software or games designed to enhance phonological awareness, or letter/sound correspondence. Some studies examine the use of speech feedback software. Only two studies focused on children's text production (Burnett, 2010). These studies position the computer either as a substitute for the teacher or as a motivational tool, still on the basis that literacy is an individual project. Moreover, in my literature search and categorisation of studies, this category generated the lowest number of studies, four articles.

In their case study, Beschorner and Hutchison (2013) described an implementation project with tablet computers. The study was conducted in two US preschool classrooms, involving 35 four- and five-year-old children and four teachers. Data were collected during seven weeks of observations and included the children's digital work samples and interviews with the teachers. The children were introduced to various applications connecting the means of reading, writing, speaking and listening. The results indicate the tablet as a positive instructional tool for developing children's understanding of print, and of the meanings of the images (Beschorner & Hutchison, 2013).

In response to prevailing digital discourse, the *Writing-to-Read Method* has quickly spread in Swedish early education (*Att skriva sig till läsning* in Swedish, see further method chapter below). Three studies have been conducted to evaluate such literacy practices using different methods and departing from different points of interest, such as their effects on children's texts and activity organisation. (a) Agélii Genlott and Grönlund (2013) quantitatively measured

87 children's performance in reading and writing using a combination of standard tests and in addition conducted observations; (b) Sofkova Hashemi and Cederlund (2016), through video observations in three school contexts, investigated the nature of teachers' instructional approaches by their epistemological beliefs, choice of pedagogical methods and factors influencing the pedagogical contexts; (c) Hultin and Westman (2013) examined changes in the literacy practice in two elementary classrooms from a pedagogical (didactical) point of view. Their data material consisted of observations (occasionally video), interviews, field notes and the collection of 12 children's texts. To summarise, in these literacy practices writing is process-oriented; the children produce longer texts with a clearer structure and with more elaborate language (Agélii Genlott & Grönlund, 2013); the texts are larger in number and consist of greater variation of genres (Hultin & Westman, 2013). Many factors are seen by the researchers to be involved in and influencing instruction; however, a key factor identified by Sofkova Hashemi and Cederlund (2016) seems to be whether technical skills and literacy are taught separately or integrated where technologies function as a tool in literacy learning. In their study, Hultin and Westman (2013) described a changed and more dialogical practice. The classrooms seem to comprise a synthesis of the traditional phonics instruction and the whole-language approach. The preschool classes participating in the present thesis are part of a project involving a similar method, *Learning to Read through Writing on the Computer*. My intention, however, is not to evaluate this method. Rather, the thesis could be seen as a complement to the studies I have just discussed.

Technology as a site for interaction around texts

Studies in this category "reflect a sociocultural model of literacy, seeing children's engagement with digital texts as patterned by and contributing to the classroom culture" (Burnett, 2010, p. 257). The focus is directed towards child-child interaction around the computer and the composing of texts, while the teacher's presence is largely omitted in the studies. In 2003, Lankshear and Knobel found in their review a scarce amount of studies that included both learners and teachers and their interplay. Thus, there are few studies that take a holistic approach to the pedagogical practice; instead children and teachers are studied separately. In my literature search (this category of studies consists of seven articles and two dissertations), this pattern seems largely to remain.

Although teacher participation is discussed, the interaction analysis of actual conversation is rarely made.

Research from the 1980s and 1990s indicates that computers potentially enhance children's interaction and collaboration when used in activities involving reading and writing, for example with a word processor, or when the computer is part of play (Labbo & Reinking, 2003). Contrasting findings are reported by Plowman, Stephen and McPake (2010), based on their video analysis of interaction episodes with three- to four-year olds in eight Scottish preschool settings. The children's interaction while using the computers was limited, a result that was contrary to the teachers' assumption (gained from interviews with them). In a similar vein, Jernes (2013) described in a narrative study, based on ethnographic field notes and video observations in a Norwegian preschool setting, how four children, four- to five years old, when playing a computer game position themselves differently in front of the screen. Jernes categorised these positions as owner, participant and observer[26], where the holder of the latter position can be seen as more or less excluded. In the activity accounted for in the study the positions shift between three of the children, while the fourth child, with Norwegian as a second language, consistently occupies the observer position. From these findings, Jernes (2013) raised the question of whether this sort of situation is an opportunity for learning for the excluded fourth child.

The physical constraints the computer partly seems to cause for the children's interaction appear to be avoided with the tablet computer. A growing body of research suggests that the portability and the touch-responsive screen encourage social interaction and collaboration (e.g., Sandvik, Smørdal, & Østerud, 2012). For example, in an implementation project with tablet computers, Flewitt, Messer and Kucirkova (2015) video-documented episodes of interaction around the technology where three- to four-year olds in a nursery, four- to five-year olds in a reception class, and school children aged seven to thirteen participated. The analysis reveals that the tablet computers offer opportunities for collaborative creativity and communication with different modes, which stimulate the children's engagement, language and literacy development (Flewitt et al., 2015). However, the researchers did notice drawbacks: "Unsupervised children often vied for possession of the iPad",

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[26] These categories are taken from a Swedish thesis written by Ljung Djärf in 2004, Spelet runt datorn. Datoranvändande som meningsskapande praktik i förskolan.

technical failure and the children's occasional frustration for not understanding program instruction (Flewitt et al., 2015, p. 302).

What can be concluded thus far is that the inherent physical properties of technology mediate certain actions. Equally important as the hardware is for the possibilities to interact is the software design and content. A Swedish study investigated the relation between child interaction and the importance of application design, for example, if the app is touch-based and includes pictures or music (Petersen, 2015). Through a video ethnographic approach in three preschools, Petersen (2015) showed that there is a correlation between the suitability of an app's content and how the children interact with it. In line with this reasoning, Wohlwend (2015) argued that in "sharp contrast to orderly matching activities in prevalent letter and word recognition apps" (p. 154), open apps such as Puppet Pals may contribute to rich collaborative literacy play, rather than formal technical reading and writing activities. Although the method for generating data is unclear in the article, Wohlwend supported her claim with excerpts showing how preschool children coordinate themselves through negotiation, engage in meaningful multimodal production and digital learning during the seemingly chaotic storymaking activity. In the empirical studies of the present thesis, this physical aspect of the interaction has not received much attention, even if its significance for the possibilities of linguistic actions is noted.

There is an assumption that interaction around the screen stimulates language and that children learn from each other. However, Plowman and colleagues (2010) empirically demonstrated that there is rarely any exploratory talk between preschool children without a teacher's presence. Rather, their interaction is found to be limited and tends to be non-verbal. The communication is characterised by turn taking and negotiation, primarily with the aim to gain access to the computer (Plowman et al., 2010). Similarly, the children in Jernes's (2013) study used what she labelled a "poor" language, often consisting of imperative utterances and questions. Foremost, Jernes claimed, the interaction constitutes a calm battle for power. An interactional analysis based on field notes of children's interaction and talk in an English nursey was conducted by Roberts-Holmes (2014). He observed two 4-year-old girls when completing a computer game. They showed shared engagement by equally controlling the devices, and their utterances and responses mainly built on each other in a cumulative manner without being challenging. Roberts-Holmes (2014) argued that the lack of more expanded talk was due to the "closed nature

of computer game" (p. 9). An example of positive collaboration is Klerfelt's (2007) study in which she described, on the basis of video observations of storymaking activities in a preschool setting, how a five-year-old girl, scaffolded by her teacher, created a multimodal story on the computer, and subsequently supported a younger friend in the same way. These studies thus give some contradictory images. Klerfelt (2007) pointed to the importance of the teacher, in terms of functioning as a role model during the first co-creation, both physically with the technology itself, but also by embracing the child's media culture as a bridge to the pedagogical practice.

Yet, another example of including storytelling in the curriculum is a case study conducted by Leinonen and Sintonen (2014.) The study took place in two Finnish preschool settings where Leinonen, in the role of researcher, supported nine children, aged three to six, in their self-initiated media production. The working process was documented by audio data and observation notes. The children used both analogue and digital technologies to produce stories, such as paper and crayons, and a digital camera, which then were compiled into short animations on the computer. The results showed that storytelling, as a social activity, enabled the children to practice increased ownership, and to be active producers through negotiations and shared decision-making, which according to Leinonen and Sintonen (2014) has implications for social learning.

All the studies discussed above point to the teacher's or the adult's importance for what occurs when children interact around the screen. For example, in their observations, Plowman et al. (2010) and Jernes (2013) showed that children often are left alone by the computer, thus, the teacher is rather absent as a conversation partner. The teachers seemed to focus on managing the turn taking and rules. Jernes (2013) pointed explicitly to the need for teachers to put words on the children's positioning process, and thereby increase the possibility for them to develop social skills[27]. In a project exploring the use of tablet computers in a multicultural Norwegian preschool, Sandvik et al. (2012) showed an example of what Plowman et al. (2010) referred to as guided participation. One teacher and five children, aged five, were videotaped when working with two applications with different content, the training of vocabulary (closed app) and story-making production (open creative app). Both applications were used to strengthen the children's language and literacy

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[27] Both Klerfelt (2007) and Plowman et al. (2010) showed that speech is not the only form of communication in preschool. Equally important for teacher support, but also for children's joint attention, is glances and bodily gestures, such as pointing or placing a hand on someone's shoulder.

learning. The analysis reveals how the teacher's scaffolding, through posing open-ended questions and by providing references to the children's previously perceived experiences, contributed to enhanced literacy learning in terms of increased understanding of words and the engagement in extensive communicative interaction, whether closed or open app (Sandvik et al., 2012). In this respect, the technology does not become merely a deliverer of literacy, but a site for interaction around texts.

Technology as a medium for sensemaking

The technology as such has a subordinated role in the studies grouped in this category (Burnett, 2010, terms the category technology as a medium for meaning-making); instead the emphasis is directed towards the digital texts as mediators for sensemaking. The studies orient differently – either they focus on children's text production or on text consumption, with the social and cultural context taken into account to varying degrees (Burnett, 2010). A conclusion Burnett drew from compiling the findings is that working with open-ended software or programs, such as online-based technology, contributes to children's increased agency and development of literacy skills. In the following, the three studies and one dissertation generated from my search concern children's own productions of digital texts. Worth noting is that most are underpinned by social semiotic and multimodal theory, which tend to focus on the relationship between a child and the product, thus overlooking the importance of social interaction for learning.

Three of the studies examine how children create meaning through art forms (Letnes, 2014) and through media texts (Mills, 2011; Rowsell & Harwood, 2015). In a Norwegian intervention study, 13 children, five- to six-year old, and teachers encountered different art forms outside the preschool setting, such as storytelling, artwork in a museum and music in a recording studio, as inspiration and a point of departure for their own multimodal storymaking (Letnes, 2014). In a narrative, in which content is generated from field notes, video observations, reflective conversations with the participants and digital productions, Letnes (2014) showed how these art encounters were perceived as aesthetic. Traces of signs and symbols from the inspiring art were then found in the children's digital productions, albeit differently represented. As mentioned above, the interconnection of text elements from various social and cultural contexts is often used by children to invent new texts based in their

own experience. By the notion of chain of semiosis, Rowsell and Harwood (2015, p. 138) analysed how children explore their preschool practice and their "literate world" by the intertextual work with popular media. Through analyses of video observations conducted in five Canadian preschool classrooms, together with collected photographs and children's artefacts, the researchers concluded that children, by using tablet computers and other semiotic resources, shift from consuming to producing texts. This shift is performed through interaction, negotiation and play.

To gain an understanding of children's meaning-making across different modes in the context of digital media, Mills (2011) conducted a longitudinal design-based classroom study. Based on the book by Roald Dahl, The BFG, eight-year olds were instructed to draw storyboard frames, script-writing, acting, filming, editing and commenting on the design process. The empirical material resulted in 200 prints and digital artefacts, audio-recordings of focus groups and observations. The analysis of the children's products and their comments to the work shows that they generally adapt to the principles of modes and manage to handle movements of content across them. Likewise, in their study, Rowsell and Harwood (2015) saw that children assign modes the same status, understanding that images provide certain meanings, while words provide others. However, since there is no one-to-one correspondence of meaning it occasionally causes problems, Mills (2011) noted; for example, when a written script has to be modified when spoken during a filming. To create the right mood in the scene, the children had to change some words and animate the voice and could thereby bridge the gap (Mills, 2011).

As hinted at here, the inherent features of the digital technologies co-constitute how the shift of modes turns out. This was demonstrated by Sakr, Connelly and Wild (2015), who undertook a study investigating how four- to five-year olds' individual creation of oral narratives during digital art-making with *Tuxpaint* software, unfold in relation to the visual activity. From a larger study conducted in preschools in the UK, three children's narrative productions were selected and analysed based on field notes and audio recordings, as well as their final products. One child, Jack, experimented with a stamp picturing a red car, with which he copied cars all over the screen. He then used a paintbrush to draw lines, similar to a spider web, over the red cars, and in response to what appears on the screen, Jack told his story (Sakr et al., 2015). From these analyses a conclusion was drawn by the researchers; the oral narrative content is created

according to what occurs on the screen, which in turn depends on how the semiotic means offered by the technology are used and made sense of.

In social semiotic theory, the transmediation process is fundamental for meaning-making, and since it involves problem solving it entails learning (Mills, 2011). Learning from a sociocultural perspective, in contrast, presupposes participation in social interaction and is considered a consequence of an individual's sensemaking. The only study presented in this category attending analytically to the interactional aspects is Letnes (2014). In multimodal digital productions, she stated, young children's increased understanding of the relationship between modalities and the content they communicate is shown through their combination of semiotic signs in different sign systems. Learning to master this, however, requires collaboration with peers, and support by a teacher, who plays a significant role in meta-language discussions (cf. Sandvik et al., 2012).

Summary

The research literature presented in this chapter is found within the field of children's narrative in pedagogical practice and within the field of literacy. To summarise, literacy is increasingly understood as a social and communicative practice and becoming literate is thus considered contingent on social interaction. 'The social turn' has implications for theories of literacy, methodology, as well as analytical approach. The studies accounted for show that young children are socialised into the narrative genre. The sources for the children's narratives are found in their own cultural experience, and the products should be understood in relation to the context in which they are negotiated and created. Several claims are made that a narrative in various ways constitutes a mediating tool for children's initial literacy learning. Therefore, it is argued that the pedagogical assignment in early childhood literacy practice should be comprised of scaffolding children in appropriating this genre. In recent years, few Nordic studies have examined children's early digital writing from a narrative perspective, and within the particular pedagogical practice that is found on the border between preschool and school, the preschool class. Furthermore, most of the presented studies emphasise child-child-technology interaction, overlooking the significance of the teacher's instruction and scaffolding for how the technology-mediated activities unfold.

From a methodological point of view, in previously research, children's technical reading skills were studied under experimental conditions. Eventually researchers began to take an interest in children's literacy learning in naturally occurring social and cultural practices. The reviewed studies have been conducted with an ethnographic approach, with the use of field notes, audio and video recordings. The reporting of findings has mainly been through descriptions and narrative accounts.

In this summary, a knowledge gap in the field of early childhood literacy is identified, which the present thesis aims to contribute to fill. A better understanding is needed of how the interaction between the participating children and teachers and the cultural tools they make use of in instructed technology-mediated activities is negotiated within the institutional framework of the preschool class. Moreover, there is a need to further investigate how digital technologies create new premises for approaching literacy in different ways. As a methodological contribution, the present thesis provides transcriptions and analyses of video recordings to make transparent what the participants actually say and do when making narratives with digital technologies (Studies I–IV).

Chapter 4 Method

Introduction

Critical for qualitative research is a coherent entity with consistency between the theoretical perspective and premises, the research questions, method for generating empirical data, and analytical unit and tools (Larsson, 2005). We should be aware that the coordination of theory and empirical observation, as Schoultz, Säljö and Wyndhamn[28] (2001) argued, "tend to organize data collection in such a manner that we find the entities that we are looking for" (p. 105); this has implications for the research findings, which need to be understood in the light of their underlying conditions. To ensure the validity of a study, it therefore becomes necessary to account for the choices made and the research procedure leading to the findings (cf. Derry, Pea, Barron, Engle, Erickson, Goldman, Hall, Koschman, Lemke, Sherin & Sherin, 2010). A transparent description is arguably an indicator of quality, and accordingly this chapter intends to present the methodology of the four empirical studies that builds on the sociocultural perspective presented in the theory chapter above.

Initially, I start by introducing the method and discuss its advantages and disadvantages. Thereafter follows a presentation of the empirical material constituting the basis for the analysis. This includes a description of the research settings and the participants, the various digital technologies used in the activities studied, and additionally the data-generation procedure. Then, a section accounting for the work with the generated empirical material follows, in terms of the transcription and translation of the films. Subsequently, the procedure for the analysis and selection of representation is described. Finally, the ethical considerations that permeate the entire research are discussed.

Video method and methodology

Given that video observation and analysis in anthropological and sociological research has been used since the early 20th century (see further Broth, Laurier

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[28] For two illustrative examples of what different research approaches, with the same object of research, imply for the results, see Schoultz et al. (2001) and Wollscheid, Sjaastad and Tømte (2015).

& Mondada, 2014; Heath, Hindmarsh & Luff, 2010), the method is scarcely used within the field of early childhood education. However, there seems to be a growing body of research that undertakes studies based on video analyses (e.g., Flewitt, Messer & Kucirkova, 2015; Klerfelt, 2007; Lagerlöf, 2016; Ljung Djärf, 2004; Petersen, 2015; Skantz Åberg, Lantz-Andersson & Pramling, 2013, 2015, 2016; Stephen & Plowman, 2008). The reason for the increased use of this method appears to be a greater interest in understanding how interaction and sensemaking occur in preschool practices, which presumably is linked to a changed view of learning (as discussed in the theory chapter). From this point of departure, there is a need for a method that enables the documentation of the children and teachers' engagement, their use of a range of semiotic means, such as speech, gesture, gaze, body movement and sound to make sense of each other's actions (Goodwin, 2000; Wells, 2009) and the use of mediating physical tools (cf. Plowman & Stephen, 2008). The potential of video benefits the generation of empirical data that position social interaction in situated activities and allows for the in-depth analysis of this interaction (Heath et al., 2010). In a similar vein, Plowman and Stephen (2008) argued the following:

> Based on the notion that the research setting is directly knowable through what we see, video is considered to provide more potentially illuminating data than questionnaires, interviews or field notes because it appears to represent the complexities of social life. (p. 93)

This reasoning indicates that ethnographic fieldwork, conducted with note-taking, commonly employed in educational science is insufficient to generate fine-grained documentation necessary to analyse interaction. An activity is multi-layered with many things going on simultaneously, and for that reason, the task to discern all the small crucial details or nuances in communication is not possible (Jordan & Henderson, 1995). In fact, an ethnographer is faced with the decision to 'on-the-spot' select what seems relevant for the analysis, implying that this way of generating data is subject to a pre-interpretation during the note-taking, and the material therefore constitutes a secondary source for analysis (Silverman, 2006).

In contrast, the video camera "records social events as they occur" (Jordan & Henderson, 1995, p. 51), and therefore produces 'raw' data that make the analysis of complex processes possible (Plowman & Stephen, 2008)[29]. The

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[29] Plowman and Stephen's main point, however, is the problem of representing these data in another format. This issue will be discussed below.

recorded films can repeatedly be played, and the technology offers the possibility of listening to people's utterances at a slower speed, which is a valuable asset in the transcription of young children's sometimes low voices and indistinct utterances. Accordingly, the video method allows the analyst to discover the interwoven significant gestures, gazes, talk and other semiotic means in interplay with digital technology, "with a level of detail that is unattainable for methods that rely on reconstruction" (Jordan & Henderson, 1995, p. 51). These characteristics also support collaborative analyses and discussions among researchers in the community, thus contributing to transparency and critical reflection of the analysis.

The interview is often employed when a study aims at examining how children or teachers perceive a certain phenomenon. However, since the interview situation from a sociocultural perspective is seen as a social practice of its own, the method is not suitable for studying social interaction in a pedagogical practice, unless the interview is analysed as a social practice (Wallerstedt, Pramling & Säljö, 2014). In other words, interviewing, from this theoretical perspective, implies that the analytical focus is directed away from the situated classroom towards the sense-making practice between the interviewer and the child in that situation (Wallerstedt et al., 2014). Therefore, an interview is not an applicable method for the studies of the present thesis.

What has been suggested thus far is that video recordings allow for more revealing details than, for example, ethnographical field notes, which may still be the most common method in educational research. For the present thesis, the unit of analysis is compatible with the choice of video data and the adopted theory since the overall interest is investigating what activities occur in children's collaborative storymaking with digital technologies, and what semiotic tools mediate their interaction. However, the method is not without dilemmas, and there are some critical aspects to consider. For instance, on the one hand, as already mentioned, video recordings provide rich, complex and valuable empirical data of multi-semiotic interaction. On the other hand, this richness can make one get lost in the details, as Derry et al. (2010) warned, and therefore a theoretically informed analytical strategy is important. The researcher's standpoint, need of data and practical constraints of the setting determine how and what is captured (Heath et al., 2010). To follow actions with a camera implies maintaining a reflexive relationship between the digital device and the recorded action (Broth, Laurier & Mondada, 2014). In this sense, by seeing with the camera, the researcher shows his/her pre-understanding of the

observed social practice, which implies that the recording constitutes a form of proto-analysis (Broth et al., 2014).

There is an ongoing discussion concerning the advantages and disadvantages of fixed versus handheld cameras, and what the decision of using one or the other entails. One of the advantages of a tripod mounted camera compared to a handheld camera is the general provision of better film quality, in means of providing a more stable film (Heikkilä & Sahlström, 2003). However, the use is also limiting, as it means being more fixed in one place. The direction of the camera lens towards something specific, that is, on what is said and when it is said, implies that the film is representing a narrow part of the ongoing event and therefore not capturing all that takes place in a situation, thus risking showing a one-sided pictured of the practice (Lantz-Andersson, 2009). In all four studies in the present thesis, cameras on a tripod are used, and since the activities unfold within a limited area – in gatherings in front of the teacher and in front of the screen – it could be argued that the main part of the interaction and communication is captured. Yet again, I am aware that obtaining complete data is impossible (cf. Plowman & Stephen, 2008). The environment with the lighting and surrounding murmur may contribute to lessening the quality of the video recording (Jordan & Henderson, 1995).

A further difficulty might be the attention the video camera possibly receives from the participants, thereby constituting an intrusive element in the interaction. This happened in Study I when some of the children initially paid a great deal of attention to the video camera. However, in accordance with what Jordan and Henderson (1995) stated, the task was interesting enough for the children implying that their engagement superseded their awareness of the camera. Another problem that may emerge is when children show resistance to participate in video observations (Klerfelt, 2007). However, in the present studies, rather the opposite took place since the six-year olds were eager to participate.

Analysis of interaction

Interaction Analysis (IA), which guides the analytical work in this thesis, is an interdisciplinary analytical method concerned with the study of events comprising human-machine interaction. IA has its roots in ethnography, socio-linguistics, ethnomethodology and CA (Jordan & Henderson, 1995). What is shared by these different approaches is the underlying theoretical assumption

that people's actions are social in origin and must be empirically studied, preferably using video technology (Jordan & Henderson, 1995). The interest in participants' linguistic actions is also common. In line with a sociocultural perspective, IA assumes that learning originates in situated social and material contexts (Jordan & Henderson, 1995). This allows for bringing together the theoretical and empirical analytical approaches to illuminate the technoloy-mediated social interaction taking place in the storymaking activities studied in the present thesis (cf. Plowman & Stephen, 2008).

The goal of IA "is to identify regularities in the ways in which participants utilise the resources of the complex social and material world of actors and objects within which they operate" (Jordan & Henderson, 1995, p. 41). To identify these regularities, Jordan and Henderson use findings from CA showing how social order and interaction constitute each other (Raudaskoski, 2006). Researchers working with the latter "seek to describe the underlying social organization" and the governing rules (Goodwin & Heritage, 1990, p. 283), and the analysis is focused on understanding structures of talk-in-interaction (for examples see, Atkinson & Heritage, 1984). Rather than isolated entities, sentences or utterances are treated as actions situated in a dynamic context (Goodwin & Heritage, 1990). This standpoint is the key for understanding how people act in a social and contingent activity, and how the actions are accomplished and responded to, subsequently leading to other actions (Heath et al., 2011). CA has been criticised for a narrow conceptualisation of context by focusing on patterns of talk, disregarding the variations of talk that depend on aspects such as gender, social status, ethnicity and culture affiliation (Norrby, 2014). However, such categories are analysed if they are made relevant by the participants themselves in interaction, rather than introduced as predefined categories by the researcher. IA takes a broader perspective to understand the research context with its routines, by including the participants' experience, together with the tools used and produced within the practice (Raudaskoski, 2006).

What foremost differs between the approaches of CA and IA is that while the former mainly focuses on talk, the latter "encompasses the whole range of behaviors through which people can 'take a turn', that is, participate in an interactional exchange system" through for example "turns with bodies' and "turns with artifacts" (Jordan & Henderson, 1995, p. 64). This wider analytical approach thus includes both psychological and physical tools, necessary for understanding complex activities aimed to facilitate learning, especially when

digital technology is involved. From the premise that participants make their understanding known to each other through sequential turn taking (Goodwin & Heritage, 1990), at least three consecutive turns must be included in the analysis. The sequence follows the pattern of utterance/act -> response -> response. This implies that the responses are identified in the uptake of the prior utterances/act or in neglecting to take up on what is said/done. In this way, an opportunity opens up to delineate what sensemaking is taking place between the participants.

Studies have shown that children's storymaking is not always talk-driven, but rather consists of multi-semiotic communication, encompassing gestures, gazes, sounds, body movements and/or physical tools (crayons, pencils and paper etc.) (see e.g., Faulkner & Coates, 2011; Wright, 2011). In this respect, IA provides opportunities to study children's transient utterances and non-verbal communication, their interaction with the teacher and their handling of digital technology in depth. For the present thesis, this analytical focus contributes to delineating how the observed children co-ordinate their interaction and establish temporarily sufficient intersubjectivity, that is, how they jointly engage in and conduct the task (cf. Heikkilä & Sahlström, 2003).

Settings, participants and digital technologies

In the following section, a presentation of the preschool class settings, the participants and the procedure of generating the empirical data are given.

The research was conducted in two Swedish public primary schools, here fictively named Park School and New Forest School. They are both situated in the same town, although in different areas. Park School is located on the outskirts with a catchment area consisting of children from families at a medium-to-high socioeconomic level, living foremost in detached houses. The school has classes running from preschool class to grade 6 and includes a recreation centre. New Forest School is more centrally located, and a mixture of apartment buildings, detached and terraces houses surround the school. The socioeconomic level among the families ranges from low to high. The school consists of three pedagogical practices: preschool, primary school ranging from preschool class to grade 5, and a recreation centre.

Park School was selected for the study due to its participation (since 2011) in a larger municipal project, *Learning to Read through Writing on the Computer*[30], targeting the children's early literacy development. Through the project, the school has received additional funding for the in-service training of the participating preschool teacher as well as portable computers and particular software products. I established contact with Park School setting in 2012 through the preschool teacher, whom I knew through my teacher profession. Shortly after, the principal gave approval for the planned observations. New Forest School had recently joined the same municipal project as Park School when I contacted them in December 2014. Of more importance for the research, however, were the teacher-initiated storymaking activities taking place in one of the preschool classes as part of the curriculum to enhance children's creative and multiple ways of communicating. An additional reason for selecting New Forest School was the teachers' and the children's daily use of digital technologies, such as interactive whiteboards (IWBs), laptops and computer tablets, stored in the well-equipped classrooms. The principal of New Forest School, who allowed my access to the classroom, was known to me through my previous teacher profession.

Although the aim of the thesis is neither to investigate nor evaluate the project Learning to Read through Writing on the Computer per se, a brief presentation is necessary to appreciate what underpins the teacher's actions during the storymaking activities. The project started in 2009 with one school, and in the academic year of 2015–2016, eight schools within the municipality participated. The observed activities are considered in this thesis as events that take place within the overarching literacy practice in which the project constitutes a significant part. No explicit theoretical framework was articulated by the project leader during the introductory presentation I attended before conducting the research, nor is it explained on the official website. Nevertheless, it appears as though the project aims to support children's development of certain skills and is therefore informed by a traditional phonics approach due to the emphasis on phonological awareness and working memory. The software connected to the project is selected to strengthen the relationship between phoneme and grapheme, by letting the children repeatedly hear the sounds of letters and words (a more detailed description will follow). According to the available information about the project, auditory and visual

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[30] The project is subject to a different name in the municipality.

abilities, and fine motor skills are highlighted in developing literacy. At the same time, it is announced that learning to read should be grounded in the child's experience of writing but also in his or her experience from other areas. Moreover, collaborative writing on the computer is encouraged for facilitating meta-linguistic discussions, indicating a functional view of language.

Three groups of preschool class children were selected to participate in the studies; two groups attending Park School and one group from New Forest School. The participating children are predominantly Swedish-native speakers. Both schools are organised in age-integrated classes (in Swedish called F-2 or F-1), and the participating groups were all part of such an organisation. The first group of six-year olds in Park School consisted of nine children (five boys and four girls). One boy was absent during the observations, thus eight children participated. Four of these eight children (two boys and two girls) were video recorded when working with the instructed task to make a digital narrative. The second group in Park School included eight children (four girls and four boys), all whom were video recorded. Finally, in the third group at New Forest School, five out of 14 children were given consent by their parents to participate. For this reason, the observations included four boys, aged six, and one boy aged seven, although the latter joined only on the first occasion. The observations were carried out on several occasions; in Park School in April and June 2012, and in February and March 2013; in New Forest School in April and May 2015 (see Tabell 1 for an overview). This implies that the observations took place during the spring semester and the 20 children (except the additional, one-year older boy) had participated in the preschool class practise for a long time and thereby gained various experience. For example, due to the municipal project, they had experienced collaboratively writing with digital technology prior to the observations. The children had also in various ways previously been introduced by the teachers to how to compose a narrative, for instance, by structuring the events in a temporal order, and including characters and setting.

Two qualified and very experienced preschool teachers took part in the studies, one at each school. The preschool teacher at Park School has special pedagogical training in digital technology as a pedagogical tool, and the preschool teacher at New Forest School has also undertaken a similar in-service training. In this respect, the two preschool teachers have a rather high level of competence. Henceforth in the text, I call them teachers.

The empirical settings and the participants constitute a purposive sample selected on theoretical grounds, due to its specific nature that can respond to

the research aim (see Silverman, 2006). It could be possible to question whether the sample is representative of a typical preschool class since the classrooms are well-equipped with digital technologies which are used by the participants on a daily basis. However, despite current differences in Sweden concerning access to digital technologies and experienced teachers, an increasing number of classrooms use technologies in early literacy practice (The Swedish National Agency for Education, 2015). The selection could additionally be seen as a convenience sample, as the people I contacted for access to the settings were previously known to me on a professional basis. As a former preschool teacher in the community, although in another pedagogical unit, I was informed about the financial investment and implementation of digital technologies, the in-service training for teachers, and the large municipal writing project in which the participating schools were taking part. In a reflective manner, it could be questioned whether our relationship, my preunderstanding and my presence in the classrooms have influenced the study design, the teachers' and the children's actions. Well aware of these conditions, I acted as a participant observer, although I made an effort to avoid interactions with the children that concerned issues directly related to the task they were given to impinge on their narrative negotiations as little as possible. However, it cannot be excluded that my presence affected their actions.

The two preschool teachers selected the digital technologies that were used in the storymaking activities. In Study I, a portable computer and three software products were used: a word processor, *Liber Office*, and two speech-synthesised feedback software products, *The Speaking Keyboard* and *Vital*. These are all included in the municipal project, Learning to Read through Writing on the Computer, and consequently not an active choice by the Park School teacher. Nevertheless, the functionality of Liber Office is to support writing through, for instance, spell checking. The Speaking Keyboard and Vital aim to support the user's understanding of the grapheme-phoneme relation, in terms of transforming print into audible sound. For example, when using The Speaking Keyboard, the writer hears the corresponding phoneme when typing a letter key on the keyboard, while the Vital voice supports in reading words, sentences or whole texts when pressing the spacebar. These speech-synthesised feedback software products are marketed by the suppliers as compensatory digital aids and are employed foremost within special pedagogy to support, for instance, people with dyslexia. In early childhood education, they are widely used to enhance children's initial writing.
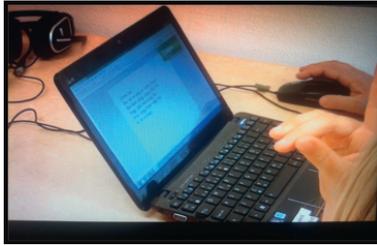
Figure 2. Screenshot of the word processor interface

Similar to the first group, the second group of six-year olds in Park School used the software described above. However, before the observations were conducted in this group the teacher had also introduced an Internet-based software application designed specifically for storymaking, *Storybird*, which the children had tested. The teacher informed me about the software, and after a discussion it was jointly decided that Storybird was to become the digital resource for Studies II and III. The reason was that we premised that Storybird could extend the children's possibilities for narrating through the provision of a large variety of images as a starting point for the stories. Since the tool was already part of the group's on-going literacy practice, my involvement in the decision should not be seen as an intervention. From a sociocultural perspective, a change of tools entails different activities. With this in mind, it must be noted that my intention is not to conduct a comparative study, rather the variation of tools offers opportunities for a broader understanding of what digital technologies provide for children's collaborative storymaking. Hence, Storybird differs from Liber Office, The Speaking Keyboard and Vital in that it has a content-based design, in the form of images, and the space allocated for writing is less than in Liber Office. Yet another difference is Storybird's lack of sound application and no offering of spell checking.

As a start, the story maker selects an initial theme (the images are organised by theme), whereupon several images become visible. Thereafter he/she decides the number of images to be included in the story, one on each page. A space for writing, which may be positioned in various ways in relation to the image, is offered (see Figure 3). Some features are the appealing layout and design of the final product, and opportunities for worldwide sharing through the publishing on the Storybird site.
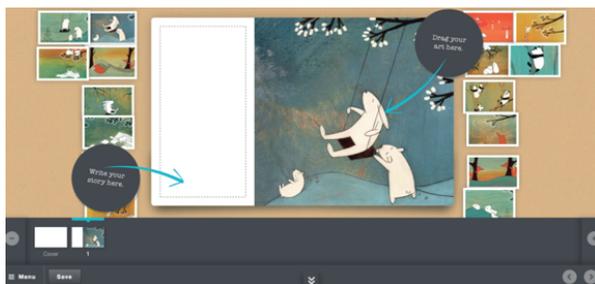
Figure 3. Screenshot of the Storybird interface.

Fixed data projectors are gaining ground in Swedish education together with IWBs (Swedish National Agency for Education, 2015). This development is reflected in New Forest School (Study IV) where almost every classroom has a whiteboard hanging. The IWB provides, through a large touch-sensitive screen, a common surface for drawing and writing, which allows for interaction in a different way than with, for example, a keyboard. In a similar way to a computer, the IWB provides access to the Internet with all its multi-semiotic resources.
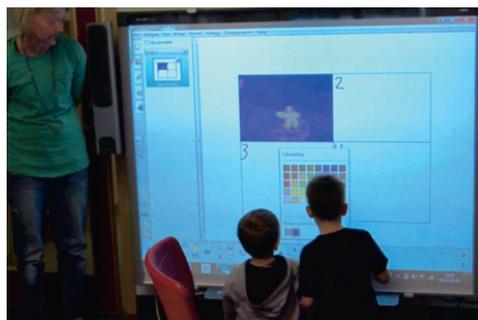
Figure 4. Screenshot of two children working on the IWB.

The supplier of the specific trademark is marketing the standard software *Notebook* as designed for supporting interactive learning, with multitudes of opportunities for creative work and access to subject-specific lessons. However, in Study IV, Notebook is used in a generic way without pre-designed material, and with the provided toolbar offering a colour palette and a rubber tool. In contrast to the Storybird application, Notebook is not pedagogically designed for the purpose of supporting narration more specifically.

Generating empirical data

The data generation is guided by the research questions and based on epistemological premises of a sociocultural perspective about sensemaking and learning as originating in social contexts, interweaving participants' engagement, mediating tools and environment and accordingly, the selected unit of analysis is the technology-mediated storymaking activity (as already discussed in the theory chapter). Since the observed instructed activities characteristically are well delimited from other activities in the literacy practice, they facilitate data generation. Video observations of such activities or literacy events can be understood as constituting strategic selection to "locate and analyze data for the purpose of finding patterns within or across events" (Derry et al., 2010, p. 14), which in the thesis implies regularities and specifics occurring in the interplay between the participants and the technologies. Importantly, as argued by Heath (2011), for example, "it is critical to record the conduct and contribution of all active participants in an activity's accomplishment to enable analysis to address the ways in which particular actions and activities emerge in and through social interaction" (p. 261). Therefore, they have all been video recorded in their entirety, from the teacher's introduction to concluding comments by the participants.

During all the observations in Park school, the children were paired in dyads in the ordinary classrooms with one portable computer per dyad, and the teacher rotated in the classroom, supporting the children. The arrangement differed with the third group in New Forest School in that one dyad at a time was placed in a separate classroom with an IWB. While the children were making stories, the teacher stood ready to scaffold their work. During the second round of observation, however, she occasionally left the room.

When video recording the activities, two cameras on a tripod were used for capturing the interactions, except for the initial teacher introductions and in Study I, where only one camera was used. The variation depended on the access to video cameras. In all cases, one camera was directed sidelong towards the children's faces or directly from the front. In Study I, I also tried to direct the camera lens to capture some of the activities occurring on the screen; however, it proved to be difficult to gain good-quality film in this way. In the other studies (II, III and IV), in which two cameras were used, the second camera was directed towards the screen more directly. As the children occasionally moved the portable computers, I needed to be observant and customise the lens.

Throughout the activities, I participated as an observer, moving around on the first occasion in Park School, communicating with the children only when they took initiative. However, I consciously made no comments on the work to influence the unfolding narrative content as little as possible. In the following observations, I took a more passive role to limit interaction and stayed behind the video camera or withdrew from it to write notes. The choice of placing the camera on a tripod thus allowed me to leave the scene and thereby draw less attention to the camera (cf. Heath et al., 2010). During the observations in New Forest School, I maintained the latter position.

Figure 5. Camera 1 placed in front. Camera 2 placed behind the participants

The empirical material consists of video recordings of 16 storymaking activities, amounting to approximately 12 hours and 23 minutes of film in total. Additionally, 15 digital stories produced by the participating children were collected and printed. Field notes and photos from Study IV are also included in the material. Tabell 1 presents an overview of the entire data material generated for the thesis and the various digital technologies used in each study. The two participating preschool teachers are not included in the figure.

Tabell 1. An overview of the empirical material

	Number of children	Number of recorded activities	Recorded time	Number of transcribed turns	Number of collected stories	Digital technologies
Study I *Park School*- April, June 2012	8 of which 4 recorded	2	1h 2min	644	7	Portable computer, headphones, mouse/Liber office, Speaking Keyboard, Vital
Study II and III *Park School*- February, March 2013	8	8	6h 18min	1009	8	Portable computer, mouse/Storybird
Study IV *New Forest School*- April, May 2015	4 (5 in the first session)	6	5h 3min	2317	—	Interactive whiteboard/Note book
Total	20 (21) of which 16 recorded	16	12h 23min[31]	3970	15	

The processing of the empirical data material

This section accounts for the processing of the generated empirical material. First, I discuss how the transcriptional work was conducted. Then, I provide a brief description of the translation of the films. Subsequently, the analytical procedure is described.

Transcription of video recordings

In a similar vein as video observation is informed by theoretical and methodological standpoints as well as research questions, so is the transcription and can therefore be seen as a result of a selective process (Derry et al., 2010; Ochs, 1979), rather than merely as the means of representing data in another medium (Heath, 2011). Transcription procedure, as described by Derry et al. (2010) as "an iterative process" (p. 15) involves moving back and forth between reviewing the original empirical material, that is, the recordings and the print. This implies that a transcript is anything but static; rather, it needs to be

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[31] The accounted recorded time refers to the amount of original film. In article II and IV a different amount is indicated and refers to the processed film of different angles.

corrected regularly during the work since new things appear when returning to the recordings (Linell, 1994), and as a result increasingly reflecting what the researcher finds relevant to the analysis (Jordan & Henderson, 1995). In this respect, a transcript must be understood as building on interpretation (Linell, 1994) and an evolving understanding of what interaction takes place in the recorded activities (Derry et al., 2010). Accordingly, a transcript should be seen as part of the initial analytical work, as a valuable complement to the video material. However, it could not supersede original data (Heath et al., 2010).

Transforming video data into a text-based form is challenging (Linell, 1994; Plowman & Stephen, 2008). This inevitably brings a literary perspective into the process (Linell, 1994). To be close to the original data, Linell claimed, a transcript must avoid written conventions in favour of the features of spoken language. Yet, another challenge is accounting for non-verbal communication taking place in the interaction, often filled with fine-tuning gestures and spoken undertones, which occasionally are problematic to re-present in print. Inevitable information is lost along the way of this transformation since, "transcription translates the 'raw' data into an easily accessible, paper-based tool for analysis but produces an incomplete representation of the video recording" (Plowman & Stephen, 2008, p. 6). However, there are no complete representations of the subtle nature of human communication, as every representation as such is a reduction and a transformation.

The scope of transcription and the level of detail might vary depending on the research aim and analytical interest. This also applies to the present thesis. The recorded films of the observations in Studies I and IV were transcribed in full by paying close attention to speech, gestures and eye gazes towards the other participants and towards the digital devices. Later the transcripts were complemented with the activities taking place on the screen. These were either specified in written within parentheses after a participant's talk-turn or marked as a separate turn. The video recordings resulting in Studies II and III were initially broadly transcribed. Thereafter, for Study II only selected parts were transcribed in more detail guided by the research questions, that is, at the core were those sequences when the children elaborated on the plot with each selected image. For Study III, one particular storymaking activity from the material was chosen to be analysed more deeply; therefore, this sequence was transcribed in full in accordance with the procedure of Studies I and IV.

Even if interactions of the kind studied in the present thesis are complex, they are mainly accomplished by speech; therefore, a transcript at a minimum

contains talk-turns (Heath et al., 2010; Heath, 2011; Jordan & Henderson, 1995). To delineate the distribution of the children's and the teacher's sequential turn-taking as rigorously and sensitively as possible in Studies I and III, a transcription key inspired by CA was used (see the example in Figure 7). This way of transcribing typically emphasises the very micro details of speech, such as lengths of pauses, intonation or prosody, which may be of significance for what unfolds in interaction (e.g., Goodwin & Heritage, 1990). However, the transcriptions in the present studies are not conducted in a strict CA manner but make use of certain aspects of the conventions together with the principles of IA, as discussed above. Guided by the research questions, the transcription level in Studies II and IV was not as detailed concerning the speech as previously discussed, but in line with IA (see Figure 8).

```
80. Melvin:  if I write all the time Tim you say what I am going to write  ((glances towards the table)) ((looks at
             Tim))
81. Tim:      yes, mmm  ((glances towards the headphone cord))
82. Melvin:  or do you want also
83. Tim:      well ((sighs))
84. Melvin:  okey, one eight (5) A (.) P (.) N (7) it says it says nothing (.) [A]
85. Tim:                                                                  [P] N
86: Melvin:  P
87. Tim:      April
88. Melvin:  A, P, R::, I:, L  ((writes two l))
89. Tim:      it is only one L
90. Melvin:  ↑ha          ((starts to delete))
91. Tim:      April, L (.) April, L is it now, it's only one L (.) but you need, but you can keep the P
             ((in Swedish pe:t, with a long vowel))
92. Melvin:  ↓okey sure P (.) apu:, ↑okey you can write then
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Figure 7. Example of a CA-inspired transcript from Study I.

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141. Teacher:  cause it should have a happy ending or do you think it should be a horrible
               ending or
142. Hampus:   horrible or happy we'll have a little grey now you know ((presses the colour
               palette icon))
143. Screen:   the colour palette is visible and the grey box is marked
144. Hampus:   thank you very much ((draws))
145. Screen:   green colour is active
146. Hampus:   no I was not was not supposed to pick wait
               ((presses the colour palette icon again))
147. Leon:     ((laughs))
```

Figure 8. Example of an excerpt from Study IV.

With the present reasoning in mind, a recurring dilemma is how to best illustrate and present a multi-layered interaction in a readable transcription model. This

dilemma is especially applicable to children whose communicative skills differs from adults' in terms of contingency in talk and their tendency to "frequently 'tune out' the utterances of their partners" due to, for example, disinterest, fatigue or lack of concentration (Ochs, 1979, p. 46). This means that a child's answer to a question does not necessarily have to be an answer to the other speaker's prior utterance but may be an answer to his/her own previous remark. In this respect, a transcript written as a script from top to bottom may mislead the reader, as it "tends to impose a contingent relation between immediately adjacent utterances of different speakers" (Ochs, 1979, p. 47). The transcript model may therefore affect the understanding of what unfolds. However, these arguments by Ochs (1979) relate to research on very young children, whereas in this thesis the participants are older, six years of age, and are assumed to have appropriated more communicative skills, such as conventional turn-taking. Therefore, a vertical transcription model was used for all studies to facilitate readability. Although, for Studies II and III the transcriptions were initially conducted in a multi-semiotic three-column model, where first the speech was transcribed, then the gestures were focused on, and lastly the activities on the screen were carefully included in the model. From an analytical point of view, this procedure was valuable to gain a more in-depth understanding of what engagement and sensemaking were taking place. At this initial stage, the transcriptions were all done in Swedish.

The translation work

Translation from one language to another, here from Swedish to English, may cause problems in terms of finding consistent words or expressions that reproduce the meaning as close as possible. The difficulty of finding correspondence between a Swedish and an English word needs to be considered throughout the translation and the analytical work (Lantz-Andersson, 2009). In Study I, for example, a translation problem was encountered especially when the teacher used a certain word that prompted negotiation among two of the children, which had consequences for the evolving plot and thus for the resulting narrative. Another example, in Study IV, was the difficulty of translating the uttered aesthetic judgments to retain their meaning. To represent the children's utterances in an accurate manner, I discussed a few translations of utterances with an English native-speaking fellow researcher (who also speaks Swedish) with knowledge of how six-year

olds would express themselves in English. Only the excerpts selected for inclusion in the articles were translated into English. The translation of the narrative content was similarly treated with care, and the characteristics of the children's occasional misspellings were emulated.

Analytical procedure and presentation

Following the tradition of IA, the analytical procedure for all four studies was conducted iteratively by viewing the video recordings and the transcripts to distinguish patterns in the participants' sensemaking and narration through their interaction with each other and with the digital technology. The focus was on identifying regularities in the participants' linguistic and bodily actions as well as their utilisation of other cultural tools. The patterns found in the empirical material contributed to the different analytical considerations in the studies. In Study I, the analytical interest was on how the institutional conditions, such as the teacher's introduction of the task, her scaffolding and the preschool class setting mediated the children's ongoing interaction. In Study II, the analysis primarily focused on clarifying the relationship between the participants' actions in the unfolding activities and the resulting digital text products. In Study III, the analysis aimed to delineate what structuring resources the children used in their narration and what the activity implied for the possibility of developing literacy skills and higher-order thinking. Two themes emerged in the empirical material, which formed the basis for Study IV: the children's and the teacher's actions struggle to establish intersubjectivity and the frequent articulation of aesthetic judgements during the narrative work. In the following chapter, the summary of the studies, the analytical procedure for each study is further developed. When reporting the findings, the selection of representative parts of the analysis comprise of a sensitive phase, as it inevitably involves a fragmentary reproduction of social actions that are inextricably embedded in the situated context (cf. Heath et al., 2010). With this in mind, excerpts from the transcriptions have been carefully selected to illustrate key aspects of the analysed interactions taking place in the observed storymaking activities.

Research ethics

Closely linked with methodology and the research process are the ethical considerations. All research involving human subjects is regulated by law. As a

complement, the guidelines of the Swedish Research Council (2017) specify the individual protection requirement that includes information, anonymity and confidentiality, which the participant shall be informed about prior to research. In line with Dockett, Einarsdottir and Perry (2009), I have adopted a procedural approach to the research process, which implies that the ethical questions are re-considered throughout the entire process with the involved children and teachers. Adding to the quality of the research, this includes the planning stage, execution, analysis and publishing of results (Coady, 2010). The reflexive approach entails a larger responsibility for the researcher than the individual protection requirement as defined by the Swedish Research Council.

When involving children younger than 15 years in research, special attention is required to ethical issues that may present challenges. First, their participation requires the consent of their legal guardians. Therefore, in the present studies, all parents received information on the study design and the conditions in written form, and the first group of eight children and their parents were additionally informed during separately held conversations with the preschool teacher. The invited parents all gave written consent for their children to participate, except for the third group (Study IV), in which only five children received permission. Second, when it comes to research conducted in an institution without parents present to assert for their child's rights, the teacher, but foremost the researcher has the ultimate responsibility for creating a safe and secure environment (Coady, 2010). This reasoning may be read as a case of positioning the child as vulnerable, dependent and as an object of research. However, an approach that instead emphasises the child's agency embedded in a social and cultural context positions the child as a competent participant capable of constructing her own understanding with support from others (Smith, 2011). From this viewpoint, engaging a child becomes a question of gaining his or her consent, which can be received through a relationship based on trust and respect between child, teacher and researcher (Dockett et al., 2009). In line with this argument, the Swedish Research Council (2017) proclaimed that even if the legal guardians have given permission for the young child to participate, the research could not be conducted if the child opposes participation. Therefore, to avoid ambiguity or misunderstanding of what is expected, the child must be informed about the research purpose in an age-appropriate way. It then rests on the researcher's responsibility to ensure that the child's voice is listened to (Dockett et al., 2009; Smith, 2011).

To adhere to this positioning of the child, I visited the two school settings before the observations took place with the purpose of becoming acquainted with the children and to inform them about the research. During the initial meetings, I used my experience as a preschool teacher and my knowledge about the context when talking to the children, explaining my interest in listening to their stories, and they accepted me doing so. The trust I felt was established between us was something that I carefully nursed during all the observations. In this way, I received the entrance ticket to the three groups, and hopefully the meetings contributed to the children's engagement in the storymaking. To acknowledge the children's voluntary participation, I repeatedly informed them about their right to abort participation at any time during the recorded activities. It must be noted, however, that I was aware of being an authority, in terms of my presence as an adult/a teacher but also a researcher, which may have impacted on the children's decisions (cf. Dockett et al., 2009).

The type of institutional activities constituting the empirical material of this thesis is not of a psychologically or physically sensitive nature. Nevertheless, since video observation as a method implies a permanency of the recordings and often displays the participants' identities, it is essential to bear in mind that ethical dilemmas might occur during the research process (see the Swedish Research Council, 2017). For a researcher, the key words of respect and carefulness to ensure the individual's integrity is central. Studies in early literacy classrooms implies the need to be sensitive to how children communicate with each other in front of the camera, and how they indicate whether they are comfortable with the situation or not. None of the children in the four present studies showed any sign of inconvenience when being filmed, neither verbally nor bodily. I noted, however, that the two observed girls in the first group (at the second occasion) initially spoke very quietly. However, when I decided to leave the camera they began to speak louder and negotiate the narrative content.

In addition to the necessity for securing the participant's protection, there are strict requirements concerning the handling of the generated empirical material (see the Swedish Research Council, 2017). In the information to the parents, it was specified that all written texts reported from the research would be anonymised. In the informed consent, it is explained that the video material may be used in data sessions within the research community to secure the quality of the analyses. To meet the requirements of anonymization, I have attempted to anonymise the material in the published studies in a way that all names are fictional, and the research settings are described in such a way they

cannot by identified. As mentioned above, photos or video films can reveal participants' identities; thus, it is particularly important that both films and photos are anonymised (Coady, 2010). Therefore, to prevent recognition of the photos or screenshots from the films reproduced in the studies, these have been manipulated. To maintain confidentiality, the empirical material (the video films, photos and the written transcriptions) is stored in a digital research storage folder provisioned by the University of Gothenburg and not accessible for unauthorised.

Chapter 5 Summary of the studies

In this chapter, a summary of the empirical studies follows. The present thesis consists of four empirical studies with the overall purpose of examining what kinds of activities emerge in instructed technology-mediated storymaking activities. The premise for all studies is that the observed activities are seen as situated literacy events and part of the ongoing practice that is embedded in the social and cultural context of two preschool class settings. The narrative genre is used as a means to engage the children in reading and writing. Both schools participate in a municipal literacy project here named Learning to Read through Writing on the Computer that partly conditions the practice with its theoretical starting point and the selected technologies. The current expansion of digital technology in early childhood education, however, is reflected in the studies through the use of other complementary technologies.

The sociocultural premise that learning is contingent on engagement in social interaction and is largely a matter of appropriating cultural tools and become a competent user in various social contexts (Säljö, 2000, 2010; Wertsch, 1998), demands a unit of analysis that encompass the interplay between the participants, the semiotic and physical tools such as digital technologies, and the institutional environment. Narrative is a socially learned cultural tool, and an important tool for thinking, communication and sensemaking (Bruner, 1996; Engel, 1995; Ochs & Capps, 1996).

Initially two studies were conducted within the framework of a licentiate thesis. Study I focused on the how the teacher's introduction, scaffolding and the functionalities of the technology mediate the children's storymaking. Study II explored the relationship between the evolving narrative negotiation and the produced stories. For the doctoral thesis, Studies III and IV were included. In Study III (based on the same material as Study II), a more in-depth analysis was conducted on a child-dyad's language-use with a focus on what structuring resources were employed. One finding from the three studies indicates a discrepancy in the children's and the teacher's orientation, that is, the children orient towards creating a story, while the teacher directs focus mainly on formal aspects of language such as writing conventions, rather than developing the children's narrative skills. The finding generated new questions of how a teacher

explicitly can develop children's narrative skills using digital technologies in the most favourable way. The origins of Study IV are thus grounded in the findings of the previous three studies and focus on what the children and the teacher are oriented towards in the storymaking activities and the role of the frequently uttered aesthetic judgements in their interaction.

The overall findings of the four studies point to the opportunities for the children to develop literacy skills using a variety of semiotic means to narrate, such as speech, written language, gestures, images and cultural experiences. Found to be vital for the ongoing activities and the produced stories is the teachers' introductions and scaffolding as well as the digital technologies. The findings also show the difficulties of establishing sufficient intersubjectivity between the participants. That is, from the children's perspective the storymaking activities appear to constitute opportunities for the creative exploration of semiotic tools in interaction with each other and the technologies, whilst the teachers mainly are oriented towards the technology of writing or developing the children's narrative competence by interweaving the visual and the verbal narrating. To a large extent, the inherent features of the digital technologies mediate the participants' negotiation and actions, thus contributing to their occasionally different projects. These findings illustrate how the relationship between instruction and learning cannot be predetermined but is of a negotiable nature. In the following sections, I summarise the four studies respectively.

Study I

Skantz Åberg, E., Lantz-Andersson, A., & Pramling, N. (2013). 'Once upon a time there was a mouse': children's technology-mediated storytelling in preschool class. *Early Child Development and Care*, 184(11), 1583–1598.

This study examined what kind of activities emerge when children in a preschool class are instructed to write a narrative using a portable computer including a word processor and two speech-synthesised feedback software applications. The analytical focus was on how the children's *in situ* storytelling activities are mediated by the teacher's introduction, her participation and by the digital technologies. The sociocultural concept of mediation (Wertsch, 2007) was used since it provides a way of accounting for how the children's narrative negotiation is contingent on the social, institutional and material conditions. Previous studies have mostly paid attention to children's use of technology, individually or interaction between them in learning activities, with

little consideration of the role of the teacher (see research on children's use of digital technology, e.g. Labbo & Reinking, 2003; Leeuwen & Gabriel, 2007; Van Scoter, 2008). There are, however, a few early literacy studies taking account of teachers' involvement, showing that an engaged and supporting teacher is crucial for children's opportunity to access the digital technologies and for developing literacy skills (e.g. Klerfelt, 2007; Stephen & Plowman, 2008). Since the 1980s, research has investigated the impact of technologies, such as word processor and speech-synthesised feedback software (similar to the ones in this study). A clear-cut image of their benefit for young children's emergent writing has not been demonstrated. However, Labbo and Reinking (2003) summarised, from the studies included in their review, that word processing to some extent contributes positively to literacy learning and cognitive growth. Increased collaborative writing, longer text production and being motivational are identified aspects in favour of the technology (Agélii Genlott & Grönlund, 2013). Similar results are shown concerning the speech-synthesised feedback software.

The unit of analysis in this study involves three particular software applications, which are all part of a municipal project in which the school participates, *Learning to Read through Writing on the Computer*. First, the word-processor *Liber Office* provides an open interface and spell checking. Second, the *Speaking Keyboard* offers audio translations of letter keys on the keyboard, thus designed to support an understanding of the phoneme and grapheme relation. Third, the *Vital* software voice enables whole words or sentences to be read. It must be clarified that the present aim is to scrutinise the interplay between the participants and the technologies, rather than evaluate their pros and cons. Regularly, the children are assigned to write texts in dyads within different genres. Thus, they are familiar with the arranged activities when the study is conducted. The teacher shortly introduces the task in the group by explaining what technologies to use and what text to write – at the occasions of observation, a story.

The empirical material was generated in a primary school, in a preschool class more specifically, situated at the outskirts of a smaller Swedish town. Eight six-year-old children participated in writing a story in pairs with the use of the technologies described above. Four of these children, two boys and two girls, were video observed on two separate occasions. In addition, the teacher's two instructions were captured with the camera. The recorded film amounted to approximately one hour and was transcribed verbatim, resulting in 644 turns of

utterances. These were analysed according to the principles of IA (Jordan & Henderson, 1995). The analysing process implies paying close attention to what the participants say, do and how they respond to each other's utterances, and to the digital technologies. Additionally, seven digitally written stories were collected.

The overall findings showed how the children's storytelling is mediated foremost by the teacher's participation, the institutional setting with its routines and the provision of digital technologies. What appears in the analysis is that how the teacher introduced the activities had significance for the children's abilities to attend to the task and regulate their actions, findings that cohere with conclusions from other studies (e.g., Greiffenhagen, 2008; Luppinici, 2007). The importance of the introduction was particularly visible in the different negotiating space allocated to the children through the teacher's choice of particular words. For example, on the first occasion, the children's choice of character is understood as an adjustment to the teacher's request of a "happy story" [in Swedish, *glad saga*]. On the second occasion, in contrast, the teacher introduced the activity in a less-specified way, mediating more negotiable space for the other two observed children.

Furthermore, what is revealed in the analysis is that the teacher foremost scaffolded the children in issues regarding technology and writing, rather than narratives. What may have prompted this particular scaffolding strategy is the school's participation in a municipal literacy project. The children showed signs of knowledge in narrative construction though, albeit the instructional focus on literate conventions they managed to collaboratively create stories by drawing experiences from popular media (see Dyson, 2001, 2003; Urban & Eckhoff, 2012; Nicolopoulou, 2011). Within the framework of the project, as mentioned, the technologies were selected mainly to support writing, and that choice seems to be reflected in the type of scaffolding. The analysis indicates that the children partly benefited from the speech-synthesised feedback software when writing, as suggested by research done in the 1980s and 90s (Labbo & Reinking, 2003; Van Scoter, 2008). Also apparent in the analysis, however, is the children's lack of operational skills, which caused impediments leading to a focus on handling the technologies per se. Additionally, much of their effort involved managing division of labour and discussing spelling and writing conventions. As a consequence, the narrative activity at times became subordinate.

Study II

The aim of Study II was to empirically clarify the relationship between the interaction taking place in six-year olds' technology-mediated storymaking activities and their final narratives. What motivated this interest is that commonly occurring in early literacy classrooms is the narrative genre, used as a vehicle to engage children in reading and writing. The ability to narrate is not innate but develops through participation in social practices in which the early childhood education constitutes one important context for learning (Brice Heath, 1983/1996; Bruner, 1996). How then the education enables children's development of narrative skills, as well as reading and writing, is a matter of importance. Through its negotiating and multimodal nature, a narrative is premised to be a significant cultural tool for meaning-making (Bruner, 1996). With the current digitalisation new opportunities for storymaking through different sign systems, such as words, images, sounds and colours are provided. Furthermore, the immersion of technology entails children's increased access to a wide range of digitalised texts to engage in from an early age, which contribute to a changing literacy practice (Marsh, 2010; Marsh et al., 2005; Plowman, Stephen, & McPake, 2010).

Research interested in these issues take various approaches, for example by engaging children and teachers as co-designers to develop a digital software/device (Bayon et al., 2003), or through intervention introducing software to enhance children's narrative discussion (Gelmini-Hornsby et al., 2011). There are studies investigating children's growing participation in media production (e.g., Leinonen & Sintonen, 2014), or study how teachers and children use different strategies and cultural resources in digital storymaking to constitute a common preschool practice (Klerfelt, 2007). The unit of analysis in the present study encompasses all participants, that is, the teacher and the children, interacting with each other and the technologies in in-situ literacy events within the institutional context of the preschool class. The questions that have guided the research involve exploring how digital technology, the teacher's scaffolding and other contextual resources mediate the children's storymaking and what constitute the different approximations of a narrative genre the children's stories exemplify.

A sociocultural perspective underpins the study, implying that the interactional aspects for learning or sensemaking are foregrounded, and that learning is mediated through the use of cultural tools (Vygotsky, 1987; Wertsch, 2003, 2007). This means that we perceive the world by, for example, conceptualising phenomena primarily through language. From this theoretical position, it is important to explore how tools mediate and qualitatively transform activities and how participants engage in activities (Wertsch, 2003). The concept of scaffolding (Wood et al., 1976) is further used to conceptualise how the teacher supports the children in the storymaking activities to more independently fulfil the instructed task.

Eight preschool class children (six years of age) and one teacher participated in the study. The primary school is situated at the outskirts of a smaller Swedish town in a relatively wealthy area. In the observed storymaking activities, the art-inspired storytelling software Storybird was used. The software provides illustrated images thematically organised as a starting point. The user may select a number of pages into which an image should be dragged, and each page provides a writing surface. Thus, the idea is to create a story consisting of these two semiotic means. No spellchecking or other support for writing is offered. The generated empirical material consists of eight collected digital stories and recorded video films of eight storymaking activities during three occasions. The recorded amount was four hours and 30 minutes.

The analytical work involves both the digital stories and the participants' interaction for the purpose of exploring how the latter mediates the final products. To delineate the characteristics of the narratives, the analysis was made partly with the terminology of Nikolajeva and Scott's (2001) work, focusing on the relationship between the written text and the images, in terms of having a complementary, enhancing or indistinct relationship. Bruner's (1996) definition of a narrative was used involving structure with a series of events, temporality, setting, characters and an encountered problem. In terms of the video recordings, sequences in which the children negotiated the plot for each chosen image and the teacher's scaffolding at these moments are at the core. The sequences were first transcribed verbatim, including semiotic means, such as speech and body movement, and then analysed according to IA with a minimum of three turns (Jordan & Henderson, 1995). The excerpts from the participants' communication were selected to illustrate the interaction that had consequences for the narrative variations.

In categorising the eight narratives, they vary to what are analytically referred to as approximations of a narrative genre, considering the relations between image and text, content and coherent structure. The three empirically derived categories are *coherent narrative*, *disconnected narrative* and *fragmented narrative*. Examples of narratives from each of these categories are illustrated in the findings of the study. The story *The Book of Friends* is an example of a coherent narrative in that it contains a setting and an evolving plot including an encountered problem by the characters. The written text is analysed as expanding the image (cf. Nikolajeva & Scott, 2001). A disconnected narrative is displayed in *The Story of Cats* as a second example, recognised by a series of separate events with narrative elements or descriptions, which do not interrelate into a coherent plot. Finally, the third example, *The Lonely Dog*, shows a fragmented narrative defined by interdependent texts and images, however not sequentially coherent, consisting of few narrative elements.

The main findings of Study II show a discrepancy between the children's extensive negotiation and telling with the appealing digital images as a starting point, and what is mirrored in the final products (see the identified categories above). The inconsistency is understood first as a result of the teacher's mediation of the activities, directing the children's attention to one image at a time, rather than scaffolding the creation of an overarching narrative. As a consequence, the children directed their telling to each image resulting in predominantly disconnected narratives. Second, the teacher addressed the fact that the children had not yet extensively mastered the written language and therefore scaffolded them by reducing and summarising their verbal telling when transforming it into writing. This implies simplifying the task of transformation between the two modes of communication, which arguably leads to tensions between the participants. To a certain extent, the children demonstrated the ability to construct a coherent narrative by interrelating events emerging from their interpretations of the image motifs. However, the teacher did not attend to the knowledge the children displayed in a way that further developed this form of communication which is, according to Bruner (1996) a prerequisite for learning.

Thus, for the children the instructional task seemed foremost to be a storymaking activity, while the teacher approached it as a writing task. However, and importantly, the teacher's support should not be seen as erroneous. Rather, since she anticipated the difficulties in appropriating the conventions of this cultural tool, she supported the children to succeed by simplifying the task,

although this leads to the different approximations of a narrative genre. The analysis of the storymaking activities highlights the importance of the teacher's participation, which arguably becomes crucial for the final result, regardless of the resources inherent in the software.

Study III

The presence of digital technology in young Swedish children's lives is significant, as current statistics show (Swedish Media Council's Annual report, 2012/13). From an early age, to a large extent, they have access to smartphones, computers, Internet, digital cameras etc. in their homes and in preschool, which entails encounters with different kinds of multimodal texts (cf. report on English children showing a similar picture, Marsh, 2010). This fairly new scenario has resulted in a public, political and scientific debate, both on national and international levels, about what the contemporary demands are for being considered literate competent. For early literacy education, the discussion generates crucial questions on how to provide meaningful technology-mediated learning activities (e.g., Burnett, 2010; Burnett & Merchant, 2013). In contrast to the still-predominant formalised and reproductive literacy instruction (van Oers, 2007), it is suggested that pedagogy should embrace a more explorative approach involving problem-solving and possibilities to draw on previous experiences to develop higher-order thinking skills (Yelland, 2011).

Against this backdrop, Study III focused on one particular six-year-old child-dyad as they were instructed by their preschool teacher to create a story together using a digital tool named *Storybird*. The study presented one example of a literacy event in which the narrative genre was used as a means for children learning how to read and write. A narrative is regarded as an essential communicative and sensemaking practice, as a tool for thinking, mediator of culture and as a vehicle for writing, and therefore a highly relevant competence to develop in pedagogical practice (Bruner, 1996; van Oers, 2007). The aim of the study was to scrutinise the children's turn taking to delineate what structuring resources (Lave, 1988) support the activity structure while creating the digital narrative. Structuring resources may encompass the way in which the child applies certain tools, his/her prior knowledge, experiences and expectations, that is, whatever resources the child evoke to make sense. Thus,

employed in analysing what Lave (1988) defined as a multi-layered activity, several structuring resources were in play. Furthermore, the concept of intersubjectivity (Rommetveit, 1974) was used to understand how the participants coordinated their actions to establish temporarily sufficient joint attention necessary to continue the activity.

The study was conducted in a primary school located at the outskirts of a smaller town on the west cost of Sweden and was selected due to its participation in the municipal writing project *Learning to Read through Writing on the Computer*. In focus were two preschool class groups consisting of 16 six-year-old children[32] and one preschool teacher. The data generation was performed by video camera during five occasions in 2012 and 2013, and the children's storymaking with the use of different digital technologies was filmed. Out of the sample of children, two girls' storymaking using Storybird was selected for in-depth analysis, as it represents a general picture of all the observations. Storybird is an Internet-based application offering thematically organised illustrated images as a basis for creating a story and a surface for writing. No spellcheck or other writing support was offered. The specially selected activity lasted approximately 35 minutes and the film sequence was transcribed verbatim with inspiration from the CA transcription key. Following the procedure of IA (Jordan & Henderson, 1995), the analytical work focused on the girls' verbal as well as non-verbal communication, such as gestures, in their interaction and in relation to the software. A minimum of three turns were taken into account. Five excerpts were selected to display how the storymaking was structured by the children, and what linguistic actions they used in the interaction.

The findings show that the children used a series of structuring resources that both facilitate and delimit the storymaking. The main resource that structured them in taking on the task was the teacher's framing by her choice of software and her introduction of the tool. This had implications for the narrative negotiation in terms of directing focus to one image at a time. Furthermore, the thematically organised images, designed to make a coherent story, are shown to serve as mediators for the children's negotiation (cf. Sakr, Connelly & Wild, 2016). However, the strict division of images, which did not allow free choice across themes, structured the narration in a limiting sense. In

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[32] Sixteen children in Park school participated in total. Eight of them used the Storybird tool and in pairs they created eight stories. I have analysed these activities.

addition, the ambiguity of the imagery became a structuring resource for the children's negotiation and allowed for interpretation and opportunities to reason beyond the situated context. On the one hand, this facilitated a decontextualised language-use, which analytically was understood by the children's referencing to various associative objects not visible in the images. For developing higher-order thinking, Wertsch (1985) maintained, this form of mediating language is required since it leaves opportunity for generalisation and abstract thoughts. On the other hand, however, the children also demonstrated a highly contextual deictic referencing through language and gestures when orienting towards the screen to coordinate their perspectives. The lack of clarity made it difficult to establish intersubjectivity.

The girls' previous experience with the narrative genre (here the adventure genre) became a structuring resource in the activity. This was identified through their choice of motifs on the images and the formulations in the verbal and written texts, which adjusted to the characteristics of the genre.

Evident in the analysis is the changing character of the narrative negotiation, which seems analogous to children's pattern of play, as defined by Schwartzman (1978). Hence, the play-related narration became a structuring resource. The excerpts were selected for the reason that they displayed the different phases in the storymaking as it evolves to be completed: the first phase implied selecting images and establishing the narrative topic, in the second phase the children began to talk about their story, parallel to preparing a play, which is characterised by the inventing and distributing of roles and building up settings. The negotiation then changes character, illustrated in the third phase, as the children shifted from discussing the plot to actually formulating and producing the narrative (cf. enacting of play).

The conclusions drawn in Study III imply that the storymaking activity is multi-layered, and in taking on the task the children used a series of structuring resources. The overall structuring resource was constituted by the institutional context, that is, the teacher's instruction and her choice of software with its provision of images. Other structuring resources were delineated in the children's interaction, such as different forms of language-use, genre knowledge and patterns of play. All these structuring resources both facilitate and delimit the storymaking. Finally, it can be argued that a technology-mediated storymaking activity as the one in this study permits the exploration of language and developing higher-order thinking, which is fundamental for literacy and

digital competences. However, a teacher's scaffolding of the linguistic actions may contribute to further expanding conversations.

Study IV

This study examined what activities occur when six-year olds are instructed to make a story on an IWB within the context of a preschool class. The research interest is two-fold: first, to investigate what the children and the teacher orient towards; second, to examine what role the frequent uttered aesthetic judgements have in the narrative activities.

In early childhood education, instructed activities with an intended learning goal are often arranged on a group level. A prerequisite for performing such an activity is that the participants succeed in creating a common understanding of what the task is about. The need for the achievement of sufficient intersubjectivity (Rommetveit, 1974) applies both between the children and between the children and the teacher, which, according to previous research, is a complex struggle. There are several reasons, for example, ambiguities in teacher instruction and the degree of provision of conceptual tools (Bendroth Karlsson, 2011); children's common experience from popular cultural media which may exclude the teacher (Änggård, 2005); and the provision of technology with a certain inherent design (Lagerlöf, Wallerstedt & Pramling, 2014). The present study aims to further examine how and to what extent the teacher and the children succeed to establish shared joint attention when digital technologies are involved. The analysis conceptualises the teacher's contingent support of the children's storymaking as scaffolding (Wood et al., 1976).

A premise for the study is that children's storymaking is a creative and an aesthetic activity (cf. Faulkner & Coates 2011), involving multiple semiotic means, such as speech, drawing and enactment (Wright, 2011). With the advent of digital technology, increased possibilities are offered to combine various sign systems in the narrative. To understand how this may be performed in technology-mediated storymaking, I draw on the Vygotskian concept of creativity, which describes how children create new things from previous experiences by different means. For children, the aesthetic aspects in their own visual artwork are important, as described by Änggård (2005) in the sense that they pay more attention to colour, form and composition than to narrative

elements. In a similar vein, Holm Hopperstad (2008) found in a study that the aesthetics are emphasised by the preschool children by readily commenting on each other's drawings through expressing aesthetic judgements of both positive and negative character. Another study of significance for the present study, since it also points to the role of aesthetic judgements, was done by Jakobson and Wickman (2008) in the context of a primary science classroom. The findings of their study reveal several purposes for the aesthetic judgements, for instance that both children and teachers frequently used them to express taste and discernment of objects, thereby making sense of the scientific content. The researchers also noted that the judgements structure the activities in terms of functioning as significant directives in moments of felt anticipation of what is to come, and in moments of fulfilled assignment (Jakobson & Wickman, 2008). The theory underlying this reasoning derives from Dewey's (1934/1980) notion of an aesthetic experience as delimited from other transient experiences but being transformative in nature and including socially negotiated actions. Thus, grounded in the data material, the second aim of Study IV is to empirically investigate more in detail what role aesthetic judgements play in storymaking activities.

The study was conducted in a primary school and in a preschool class situated in a smaller Swedish town. The setting was selected due to its participation in the municipal project *Learning to Read through Writing on the Computer* and for being well equipped with various digital technologies. One experienced preschool teacher and four children aged six participated. Six storymaking activities were video recorded with a pair of children at a time in an adjacent classroom. The data material includes field notes and film that approximately amounted to four hours and 30 minutes, which was transcribed in full including the participants' speech, gestures and sign making on the screen. In the foreground is the verbal language through which the aesthetic judgements can be distinguished. In analysing the material according to the principles of IA (Jordan & Henderson, 1995), the focus has been on the interaction and on the participants' utterances and responses to each other and to the IWB, encompassing a minimum of three speaking turns. Excerpts from the transcription display instances where the participants' seemed to struggle to achieve sufficient intersubjectivity to be able to continue with the task. Furthermore, a selection of excerpts was made due to their clear illustration of frequently articulated aesthetic judgements.

To understand the framing of the activities, a presentation of the digital tools is necessary and of how the teacher introduces the task. The IWB has a generic and touch-sensitive screen, which means that several people can work on it simultaneously. In addition, the standard software Notebook was used offering a toolbar consisting of icons containing pencils, stamps, a rubber tool and a colour palette. Due to design, the teacher prepared the activities by squaring off four empty boxes, numbered 1–4, on the screen, thereby limiting the space and provide guidance through the creation of the narratives. In her initial introduction, the teacher recapitulated previous common print-based storymaking by referring to how they were structured and what they contained. She was explicit in what the learning goal was, to develop narrative skills, and maintained her scaffolding throughout the activities in accordance with that intention.

One of the two main findings in the analysis is that the inherent design of the technologies, in terms of the generic large surface, the provision of a colour palette and a rubber tool evoked creative activities expressed in the visual art. As a result, a tension unfolded between the teacher's request of a verbal narrative as a complement to the children's drawn narratives, and their exploration of the functionalities of the technologies. Thus, the children's focus on the colour palette and seeming reluctance to narrate verbally occasionally led to insufficient intersubjectivity between them and the teacher (cf. Rommetveit, 1974). A closer analysis of the depicted objects on the screen and the children's actions shows that the narratives and their meanings are embodied in the material; foremost expressed visually by shapes and colours in a metaphorical way, as well as enacted through gestures. Thus, the hands and eyes function as instruments of perception, a finding in line with Dewey's (1934/1980) reasoning on an aesthetic experience. What the teacher requested was in fact a demanding task, that is, condensing a visual narrative, which has been accomplished by the children with several equally expressive means into merely speech (Wright, 2011).

The child-dyads, for their part, seemed to succeed in establishing sufficient intersubjectivity to go on with their visual project. To the analyst's understanding, this joint attention might originate in their common cultural experiences of popular media, in terms of characters and their features, which are resources for the narrative content. This conclusion finds support in other studies, such as Dyson (2003), Fast (2007) and Änggård (2005).

The second emerging main finding shows that both the teacher and the children frequently resorted to aesthetic expressions in the form of anticipatory judgements on actions and on visual objects on the screen. The reason involves the design of the Notebook and the provision of a colour palette. Aesthetic judgements are part of the linguistic 'toolkit' and used in communicating about what a person likes or dislikes, and as such they are, in line with Jakobson and Wickman's (2008) studies, indicators of what children learn in an activity, in terms of identifying what is and is not relevant for being able to pursue the task. Thereby, they play a significant role in directing the activity forward towards fulfilment/consummation.

Chapter 6 Discussion

Introduction

In the present thesis, I have investigated what kinds of activities emerge when six-year olds are instructed to narrate with various digital technologies within the context of the preschool class. The findings, which are further discussed in this section, should be understood in the light of the observed schools' participation in a municipal project (Learning to Read through Writing on the Computer), which constitutes a part of the literacy practice. The purpose of this thesis, however, was not to evaluate the project; rather, the ambition has been to unpack some of the multi-layered storymaking activities occurring within the framework of the practice. The choice of the unit of analysis lends itself to this ambition, as it allows for in-depth analysis of the children's and teachers' participation, interaction, their sensemaking and narration with and around the technologies as well as with other cultural tools. As these aspects inevitably are intertwined in the situated activities, a reduction of the complexity, in terms of isolation of speech, other actions and their implications, can pose a challenge. The intertwining necessarily means that in the discussion all aspects are involved, although one aspect alternately is at the forefront while others are subordinated.

In summarising the findings of the four empirical studies, two overarching research questions in part govern the disposition of this chapter: *In what ways do the digital technologies, other cultural tools and the teachers' scaffolding mediate the children's storymaking activities, and what instructional challenges emerge in technology-mediated activities within the preschool class context*? The essential foundation of any communication is intersubjectivity, Wells (2009) maintained. Therefore, as a starting point I discuss the significance of establishing intersubjectivity in pedagogical activities and elaborate on how this is managed by the participants. In this way, the relationship between instruction and learning is introduced. The discussion then continues from the perspective of the children by addressing findings that show how their repertoire of semiotic means or multiple cultural tools mediate the stories. Thereafter, the focus shifts towards the teachers since their participation has a central role for the children's possibilities to perform

the task. Through the concept of scaffolding, the teachers' role in planning, setting up and conducting a technology-mediated activity is problematised. Then follows a paragraph that addresses the storymaking as a child-centred, creative activity and its link to literacy. In the wake of the entry of digital technology into the literacy classroom, there are apparent signs of a practice in change. Subsequently, thoughts related to this are discussed. By zooming out from the studies, a critical discussion is presented, concerning the instructional challenges the preschool class faces by the implementation of digital technology, but also by new policy documents. Finally, this chapter is rounded off with a concluding remark, including pedagogical implications, and an elaboration on further research.

Instruction, learning and intersubjectivity

From a sociocultural perspective, the goal of instruction is among other things to introduce children to cultural tools, or "socioculturally provided and sanctioned semiotic means" as Wertsch (2007, p. 190) termed it, and further to encourage appropriation and social use of the tools in a meaningful and flexible manner. These tools may take the form of a spoken word (e.g. a concept), or a physical artefact by which the teacher in a pedagogical activity bases the foundation for establishing intersubjectivity between her/him and the children (Wertsch, 2007). If the teacher succeeds or not, in terms of whether the children learn what is intended, is, however, an empirical question. Several studies conducted in early years education context demonstrate a complex relationship between instruction and learning (e.g., Bendroth Karlsson, 2011; Kultti & Pramling, 2015; Lagerlöf et al., 2014). The reasons for the complexity are suggested to be, for example, teachers' insufficient instruction or deficient provision of functional tools to perform a task (Bendroth Karlsson, 2011). On these premises, children's understanding of the purpose of the task and their opportunities to collaborate might be constrained, as well as the extent to which a teacher and children are able to coordinate their perspectives. Thus, what a fair amount of previous research show is absence of a one-to-one relationship between instruction and learning, which also is consistent with the findings in the present studies.

In the present studies, in the initial observations of the three groups, both teachers frame the task as a storymaking activity by introducing the concept of narrative (they use *saga* in Swedish), and by presenting the selected digital

technologies, although by putting different emphasis on them. Despite the seemingly sufficient introductions of both concept and technology, it is clear that the teachers and the children at times orient themselves in diverse directions during the activities. One observation is how the instructions in varying degrees became the subject of negotiation between the children, as they seemed to need to make sense of the situation and create a mutual understanding of how to perform the task. This claim is supported by Greiffenhagen's (2008) statement that "what the task 'is', is not entirely established through the teacher's initial formulation, but progressively clarified through pupils' subsequent work, and in turn ratified by the teacher" (p. 35). One example from the empirical material is how a single word uttered in the instruction, happy (in Swedish *glad*), causes a negotiation between two boys about whether their suggested protagonist fits into a happy story (Study I). As an attempt to adjust to the teacher's demand, the suggestion eventually is replaced by another more suitable character.

The at times insufficient establishment of intersubjectivity in the observed activities can be explained partly by what the teachers focus their scaffolding on and partly by the selected technologies. For example, rather than supporting the children's evolving narrative competence, the teacher at Park School foremost scaffolded technical issues and the conventions of writing, whilst the children oriented themselves towards the storymaking by verbal means (Studies I and II). As a result, the teacher withheld the necessary tools from the children to further develop this fundamental form of communication (cf. Bendroth Karlsson, 2011, in the domain of visual art making). In contrast to the teacher at Park School, the teacher at New Forest School explicitly in her introduction communicated the specific learning goal, to practice narrative construction (Study IV). Despite the consistency between instruction and scaffolding through the provision of typical narrative markers such as 'once upon a time' or questions like 'what happened then', it is a struggle for the teacher and the children to coordinate their perspectives. The reason is assumed to be the inherent features of the digital technologies that above all mediate what primarily becomes a visual and aesthetic project for the children, rather than a storymaking accompanied by verbal means, as the teacher additionally requests. Introducing children to new technology can motivate them and enhance their curiosity, which is beneficial to their engagement (e.g., Flewitt et al., 2015; Roberts-Holmes, 2014). It may, however, also imply that the exploration of the technology contributes to distracting them from the purpose of the activity, and

thus further limits the coordination of perspectives (cf. Lagerlöf et al., 2014, in the context of musical technology).

The findings indicate that what primarily contributes to the child-dyad's establishment of temporarily sufficient intersubjectivity is their previous and mutual experience of the narrative genre and of popular culture. This is now well documented by researchers such as Dyson (2001, 2003, 2010), Fast (2007) and Marsh (2010; Marsh et al., 2005) who show that children gain rich experience of popular cultural texts from media, for example, books, films, television, computer games and software applications, at a very young age and these experiences constitute a common platform of knowledge to build upon when entering early education. During a print-based story project in a preschool, Änggård (2005) noted that children's shared taste preferences for popular cultural characters serve as a delimitation against adults and through this preference, the children manifest their solidarity with one another. In the present studies, however, the children did not significantly mark this solidarity between themselves vis-à-vis their teacher, most likely due to the fact that the teachers acknowledged the media characters that they drew upon. Thus, the tensions described in the studies by Fast (2007) and Urbach and Eckhoff (2012) are not visible in the observed activities. Nevertheless, the children's seemingly taken-for-granted assumption of a mutual experience contributes to an attunement towards each other with a sense of immediacy sharedness, which in turn enables reduction of longer explanations of actions made (Bråten, 1998; Rommetveit, 1998). Despite the sharing of experience, it is clear from the data material that the negotiation of sign meaning is at times required, as intersubjectivity, due to its fluctuating nature, is difficult to maintain for a longer period (Rommetveit, 1974). Against this backdrop, it is worth mentioning that the intertextuality, that is, the 'remixing' of media-driven texts are in a sense universal texts (Rowsell & Harwood, 2015), in which the children symbolically can explore ideas and emotions together (Wright, 2011). These texts therefore constitute 'pathways into school literacy' (Dyson, 2001, 2003).

When studying young children, Kultti and Pramling (2015) suggested that an analysis of the coordination of perspectives may need to include the coordination of semiotic means, deictic and expansive referencing, and employment of past and present experience. Although the children are older in the present studies, these aspects are indeed valuable for understanding how they are used in the struggle to accomplish a task. The coordination of semiotic means is attributed specifically to the participating children since they, in

addition to linguistic signs (to which I return to below), frequently resorted to gestures and gazes. Plowman et al. (2010) also note that children interacting around a computer more often use non-verbal than verbal means to create mutual attention to a task. Likewise, in Study III, a common gesture was pointing towards the screen during for example interpretation of digital images for the purpose of drawing attention to a mutual point of reference. In a similar vein, the teachers (especially the one at New Forest School) pointed at the screen as a strategy to direct the children's attention to their work. This communicative strategy serves as a tool to facilitate understanding and to temporarily establish sufficient intersubjectivity to continue the narrative. This is a finding that comply with what Klerfelt (2007) found I her study.

Accordingly, how a storymaking activity is defined and negotiated by the participants, as well as how they manage to coordinate and sustain their perspectives, depends on several aspects: the teacher's instruction and scaffolding focus, and on the space allocated to the children to use their previous experience. As it appears, the digital technologies with their inherent features are also significant contributors to what extent the participants can establish temporarily sufficient intersubjectivity.

Storymaking with a repertoire of semiotic means

This section specifically targets the participating children and their repertoire of semiotic means. The empirical material reveals a repertoire that includes speech and gestures, different symbols and colours. An extensive body of research has shown similar use among children, and these different means are assigned the same status during drawing or telling, albeit are used selectively, in combination or in isolation to achieve the intended purpose[33] (e.g., Kress, 1997; Mills, 2011; Theobald, 2016; Wright, 2011; Änggård, 2005). However, communicating with others requires knowledge and ability to apply different sign systems and symbol conventions in an intelligible way (Klerfelt 2007). In her studies, Letnes (2014) found that multimodal storytelling in a digital environment may be beneficial and contribute to children's deeper understanding of semiotics and

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[33] Already in Vygotsky's (2004) writing attention is drawn to this phenomenon that is termed syncretism.

media relations. Findings from other studies contribute to a more ambiguous picture to which present studies link.

With respect to children's multiplicity of semiotic means, the present discussion nevertheless initially focused on their linguistic actions (see theory chapter where I elaborated with reference to Wertsch (2008) that language is appreciated as a tool for action). Research on younger children interacting in front of the screen shows rather 'poor' or limited language use (e.g., Plowman et al., 2010). Their talk often has the character of being cumulative or disputational (Roberts-Holmes, 2014), or takes the form of comments and imperatives to gain control over the mouse (Jernes, 2013). This type of limited language is also observed in the current studies, although the language usage varies, ranging from a limited to a more expressive, emotional and aesthetic use; not in a linear sense but fluctuating during the negotiations. Characteristic of limited language is the use of context-bound deictic words and, being subject to changes in meaning, they are often supplemented with pointing gestures to be understood. This form of communicative pattern, containing a great deal of deictic references (such as "here", "there", "that" and "this"), appears to be particularly prevalent in technology-mediated activities due to "the visual and interactive aspects of the technology" (Ivarsson, 2003, p. 398). Such a vocabulary does not appear beneficial for creating a rich narrative.

In contrast to deictics, and what could at times be discerned in Study III, is that if the mutual reference point consists of an illustrative image, the imagery can by evoking emotions and imagination mediate an expressive or semiotic language, and thereby connect to symbolised ideas (cf. Wohlwend, 2015). The two girls' exploration of concepts that extends beyond what the image represents may serve as an example (Study III). According to Wertsch (2007), it is common that children, such as the two girls, test their emergent understanding of concepts in social interaction. Still, storymaking is to a certain extent conditional on the agreed narrative topic (cf. van Oers, 2007; Theobald, 2016), which the findings in Study III (and Study II) indicate. The narrative topic, though, is agreed upon based on the digital images the software offers, which implies that they set the frame for the girls' narrative negotiation, rather than the fact that a pre-invented story precedes the images. This conclusion is consistent with the findings of Sakr et al. (2015) showing how children's use of the semiotic means offered by the technology has consequences for the narrative content. Nevertheless, for instruction the linguistic actions evolving during the narrative are beneficial, as they provide the teacher with the

opportunity to identify and then adjust the scaffolding to the continued appropriation of the concept in question, which in turn contributes to literacy learning (see Sandvik et al., 2012, for an illustrating example of an extended dialogue between children and teacher during storymaking with a computer tablet).

Part of the human linguistic repertoire consists of aesthetic expressions or judgements, with which people evaluate objects and actions according to appreciation and taste. The participants in the studies are no exception. What is particularly noted in Study IV is the more frequent use of aesthetic judgements, for example, nice, weird and cool in relation to comments on matters such as a drawn object. The mediating tool enhancing the aesthetics is understood to be the selected technologies (the IWB and Notebook) and the provision of a colour palette, which captured the children's interest and contributed to their visual art and what Dewey (1934/1980) conceptualises as *an* aesthetic experience. The articulated aesthetic judgements in Study IV are given an expanded role than merely expressing taste preference. That is, the aesthetic judgements play a significant role in the children's negotiations about what elements to include or exclude in the narrative, and in moments of anticipation (e.g., whether a selected background colour has the right nuance in relation to a drawn object), or in moments when the activity (or the work with a particular box) is brought to its fulfilment. In a similar vein, Jakobson and Wickman's (2008) study from elementary science classrooms shows that aesthetic judgements are essential for the students' conceptual learning. Accordingly, these findings suggest that aesthetic judgements, as directives in activities, constitute important indicators of what children know and learn.

As mentioned above, children's creative activities typically involve a combination of multiple means and meaning is communicated in different ways. This implies that narrative elements are not always spoken or described in writing, rather they can be embodied in a material, by gestures or by vocal sound (Coates & Coates, 2006; Theobald, 2016; Wright, 2011). For instance, objects depicted in a drawing gain narrative qualities through a metaphorical use of colours and shape, as exemplified in Study IV when red whoosh lines behind a car are used to symbolise a fast movement. Two illustrative examples of embodied narration through gestures in the empirical data are, first, Vera, who simultaneously used a hand gesture and an animated voice to reinforce her utterance of scary story (Study III), and second, Hampus who turned toward his peer and enacted the claws of his drawn monster (Study IV). To represent

a drawn object through a gesture or imitate something to support the verbal narrative is a symbolic act (Klerfelt, 2007). For the symbolism to be meaningful, however, the interactive participants must ascribe the gesture the same meaning (Grossen, 2009). Only then may the gesture constitute a semiotic means for narration. The same applies to narrative elements expressed in drawings as above, which, similar to writing, "involve the attempt to give symbolic representation to what has been understood" (Wells, 2009, p. 170). Thus, from a learning point of view, such storymaking activities provide opportunities for children's initial understanding and mastery of socially and culturally shared symbolic conventions.

Even if younger children assign different semiotic means equal status in their creative work, each mean is governed by its own laws (Vygotsky, 1987). The search for consistency and later discovery of a discrepancy in meaning potentials may create anomalies for a child, Mills (2011) argues. The most problematic transformation in the present studies seems to be the one between the spoken and written language system (Studies I–III), although the transformation from the visual to the verbal in Study IV also seems to be challenging for the children. In short, speech consists of a continuous stream of transient sound, and in a dialogue, a speaker's utterance often leads to incomplete phrases due to the participants' tacit understanding of the common subject in focus. The written language system is more conditional in terms of rules and its structure in entities that requires a syntax including both subject and predicative to be understandable for a reader[34] (Liberg, 2007). A transformation of meaning between these two sign systems implies a high level of abstraction[35]. The teacher at Park School anticipates the six-year olds' difficulties with this latter technology, and therefore she scaffolds them by writing down their verbal stories on a paper. The children mostly accept the discrepancy that arises between the comprehensive telling mediated by the inspiring digital images (Studies II–III), and what the teacher writes down in a reduced form. Occasionally, however, the transformation causes tension between the participants (especially analysed in Study II). Worth mentioning is that in Study III, the two girls themselves discover the difficulty of transforming their verbal narrative into writing. The insight that narrative is manifested in

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[34] The division of spoken and written language can be questioned since the claim is based on different starting points. Speech is seen as an activity, while the written is viewed as an object. If writing instead is seen as a process, the differences are reduced (Liberg, 2007).

[35] See Olson (1994) for a critical discussion of the relation between spoken and written language.

another way through writing indicates an awareness of the different meaning potential offered by the semiotic means. As indicated above, in Study IV, a tension was seen in the transformation between the visual and the verbal narration. This finding finds support in Wright's (2011) writing, which shows how a story made by children with several equally important means subsequently turns into a simplistic version when transformed into the verbal.

Scaffolding in digitalised early childhood education

The altering instruction and learning in digitalised early education induces a scholarly debate about the necessity of a reconceptualisation of the concept of scaffolding, as originally defined by Wood and colleagues in 1976 (see e.g., Elbers et al., 2013; Englert et al., 2004; Warwick et al., 2013). For example, Yelland and Masters (2007) suggested that effective scaffolding includes a range of cognitive and affective strategies, but also technical ones. According to them, cognitive scaffolding denotes the support of children's conceptual and procedural understanding in technology-mediated activities, and by affective scaffolding the children are not only kept on task but also encouraged to, in Vygotsky's terms, higher levels of thinking. From my point of view, however, both cognitive and affective strategies are already embedded in Wood and his colleagues' (1976) key characteristics of scaffolding (see theory chapter). Accordingly, there is no need to reconceptualise these dimensions of the concept. However, Yelland and Masters (2007, p. 367) interestingly highlight technical scaffolding in terms of software program features that by their "inbuilt constructs to facilitate understandings and problem solution" have the potential to be "mediators of learning". In this regard, a teacher's choice of technology will have significance for a child's possibilities to perform a task.

In a similar vein, Warwick et al. (2013) extended the concept to gain a deeper understanding of scaffolding processes in activities where digital technology is included. By taking into account the whole planning and realisation process of an instructional technology-mediated activity, they make a distinction between direct and indirect scaffolding, which both are built on contingency "based on the teacher's informed judgement (from their prior knowledge of the child)" (Warwick et al., 2013, p. 43). By direct scaffolding, the researchers pertain to the original idea that a teacher provides a sensitive and contingent support during the children's performance of a task. With indirect scaffolding they refer

to how a teacher, by for example, selecting a specific software and/or application, may recruit and motivate the children. In the current studies, this motivational aspect is visible, as the technologies broadly seems to mediate the children's involvement in the narratives. By the choice of technologies, a teacher can also in advance determine the degree of freedom in handling the task (see further in the theory chapter).

Concerning the scaffolding strategy of degrees of freedom, both Yelland and Masters (2007) and Warwick et al. (2013) suggested that the materiality of the technologies co-constitutes what is possible to do in an activity. That is, the inbuilt features are designed to serve certain purposes[36] and can be both generic (i.e. allowing the user to create the content, e.g. word-processor) and content oriented (e.g. a storytelling software) by nature (Kluge, Krange & Ludvigsen, 2014). In line with the scaffolding idea presented by Wood and colleagues (1976), these features might serve to control the children's degree of freedom in the activity and thereby facilitate concentration on a few elements at a time. The technologies used in the four studies consist of both generic and content-oriented software and confine the degrees of freedom in varying ways. For instance, in Study I, Liber Office, The Speaking Keyboard and Vital are technologies that target the means of writing and the latter two aim specifically to reduce the children's anticipated difficulties of the phoneme-grapheme relation. Whilst in Studies II and III, through Storybird the degree of freedom is regulated to a more limited writing space, and to the choice of thematically and sequentially organised images. In Study IV, an IWB with the standard software Notebook was used, providing a generic touch-based interface that allows for multimodal storymaking on a large screen. In the observed activities, however, the teacher delimited the surface by dividing it into four boxes (due to the design). Presumably, the participating teachers have consciously selected the technologies based on the consistency between the inherent features and the intended learning goal. However, drawbacks became visible in the analyses that might not have been predicted. For example, when the children's lack of operational skills in handling the right keys causes impediments implying that much attention is put on the technologies per se, and thereby distract focus from both writing and the narrative content (Study I). Another drawback was shown through Storybird's provision of established themes, that is, the

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[36] It has to be noted, that even if the designer of software has an intention of how to use it, research shows that the user does not necessarily act on these intentions (e.g., Lantz-Andersson, 2009; Wallerstedt, Pramling Samuelsson & Pramling, 2015).

organised images are built on coherence rather than potential conflict or discrepancy, for example not allowing a cat theme to also contain dogs. This implies a limited resource for making involving stories. In such contexts, direct scaffolding of the teacher is crucial.

Additionally, a teacher has the responsibility for arranging engaging tasks that allow children to co-regulate their actions and gradually take over the responsibility for the outcome (Warwick et al., 2013). This reasoning is consistent with the original concept of scaffolding, which refers to a temporary contingent support that gradually decreases. There is little analytical work on the fading and transfer of responsibility related to scaffolding (Littleton, 2013). When it comes to technology-mediated activities, the transfer of responsibility may be carried out differently depending on the technology. For instance, speech-synthesised feedback software becomes redundant and loses its scaffolding function when a child has appropriated the technology of writing. In Studies II, III and IV, the teachers partly hand over the responsibility to the children by occasionally leaving them.

In the context of an IWB-based task accounted for in their study, Warwick et al. (2013, p. 49) claimed, "if scaffolding is represented by contingency, fading and transfer of responsibility, then it seems that direct interaction with the teacher may not always be necessary". Based on the findings in the present studies and previous research (see e.g., Jernes, 2013; Plowman et. al., 2010; Sandvik et al., 2012) this claim could be questioned, at least in early-year classrooms. In one sense, the choice of digital technologies and design of a task co-constitute the context and provide certain indirect scaffolding. Still, based on the findings of my studies, I argue that a teacher's direct and sensitive scaffolding during the working process is crucial for how an activity develops. In fact, it is now well-known that children's success in literacy learning is dependent on "the amount and quality of talk, interaction and mentoring they receive from adults and peers" (Sefton-Green et al., 2016, p. 13). By explicit instruction, by removing obstacles that risk leading to failure (as shown in the studies to be largely due to the digital technologies), by posing open-ended questions and by affective support, the teacher's scaffolding implies making the task and its aim comprehensible for the child.

Storymaking – a child-centred literacy activity

To understand the characteristics of children's storymaking activities, it is necessary to acknowledge their embeddedness in a wider historical, social and cultural context. Since children are part of society, they often encounter the narrative genre early in life, and eventually take the narrator role themselves (Brice Heath, 1983/1996). In this way, children become co-carriers of culture and thus contribute to further cultural development through their experience (cf. Khimji & Maunder, 2012; Nicolopoulou, 2011). Accordingly, from this theoretical viewpoint, narrative skills are thus not seen as innate, rather something children learn through participation in various social contexts. Bruner (1996) pointed out that if a narrative is to be an instrument of the mind on behalf of meaning-making, it requires work on our part – reading it, making it, analysing it, understanding its craft, sensing its uses and discussing it (Bruner, 1996, p. 41).

The primary source for stories is the family (Engel, 1995). However, many children spend much of their daily time in early childhood education, and for that reason the institution need to take responsibility for providing opportunities for narrative thinking (Bruner, 1996). How is this achieved in the most favourable way? In early childhood education, literacy practices are organised in diverse ways (Fast, 2007; Flewitt et al., 2015; Skoog, 2012). The very key to meaningful child-centred education, however, Marsh (2010) suggested, is the children's own culture and experience, which most likely increase their engagement as well as their agency. In a similar way, Wells (2009) pointed out the importance of children's own story production for ownership. Inspirational sources for stories are, apart from the family, as mentioned, various digital texts, which may potentially alter children's perception of what it means to be a reading and writing person (Marsh, 2010). Thus, new 'learning scenarios' emerge as a consequence of these encounters to which the pedagogical practice has to respond and further acknowledge a literacy transition across social contexts (Fast, 2007; Lankshear & Knobel, 2003; Sefton-Green et al., 2016). The practice must endeavour to organise playful and exploratory tasks to enhance children's literacy and numeracy (Yelland, 2011).

The activities under scrutiny in the present studies could be a response to such request, designed for providing the children with opportunities for collaboration and negotiation within the framework of storymaking. The activities to some extent contribute to an aesthetic experience and to symbolic

thinking, as the children may build upon their cultural experience (traces of popular cultural texts appear in the narratives) and use their repertoire of semiotic means to create meaning. Vygotsky (2004) asserted the close relationship between children's storymaking, dramatization and play, and since play is considered the root of creativity, narrative-related or dramatic-play ought to be prominent in pedagogy. In line with Klerfelt's (2007) findings, all three dimensions – storymaking, dramatization, play – are noticeable in the observed activities by, for example, the dramatic gestures or voice animations expressed in coordination with verbal means. Furthermore, in Study III the relationship between narrative and play appears somewhat different. The way in which the narrative negotiation and the subsequent writing of the story is performed resembles well-known patterns of children's play. In this sense, narrative and play could be linked to literacy and creativity.

As a site for both interaction and sensemaking, the technology-mediated activities (cf. Burnett, 2010) then offer potentials for innovation and thinking 'outside the box'. Some caution should be taken into account; what previous research indicates, consistent with the present studies, is that opportunities to practice agency largely depends on the inherent design of the technology (e.g., Petersen, 2015). My analyses show that some of the digital technologies (especially a keyboard and a speech-synthesised feedback software) in relation to the technology of writing offered the children some resistance, which at times led them away from the storymaking and caused frustration (Study I). This complexity was also noted by Razfar and Gutiérrez (2013, p. 66), who stated, "children have to simultaneously become literate in the technology while pursuing the context of the narrative".

A literacy practice in emergent transformation

In the literature within the broad field of early literacy education, a pedagogical practice in transformation emerges. Two major trends may be distinguished; first (foremost through the revolution of tablet computers) literacy practices in preschool/school tend to be perceived as collaborative, creative and play-enriched environments, offering children agency to engage in multimodal sensemaking (see e.g., Flewitt et al., 2015; Leinonen & Sintonen, 2014; Roberts-Holmes, 2014; Rowsell & Harwood, 2015; Wohlwend, 2015). Second, and in contrast, research shows that early literacy practices (mainly applies to the preschool class and the first two years of school) partly consist of structured

exercises with instruction consistent with the acquisition tradition of literacy (e.g., Skoog, 2012[37]; Sofkova Hashemi & Cederlund, 2016). Such practice implies a focus primarily on formal aspects of language, which reduces reading and writing to technical skills. When digital technologies are implemented in such practices, they are often positioned as a deliverer of literacy (cf. Burnett, 2010). As described above, the method Learning to Read Through Writing on the Computer could be applied to this description due to its pedagogical purpose together with the choice of technologies. Through analyses of early-year classrooms in Sweden working with the method, both Hultin and Westman (2013) and Sofkova Hashemi and Cederlund (2016) reported a practice in transformation. They discerned a literacy practice "caught in between two pedagogical paradigms" (Sofkova Hashemi & Cederlund, 2016, p. 2), on the one side, the phonics, and on the other side, the whole language tradition, implying a practice that reconceptualises literacy in a broader sense (Hultin & Westman, 2013). The two preschool classroom practices in the present study can also be said to operate in both traditions. The argument for this claim is, on the one hand, as participants in the municipality project they both use especially selected technologies that support technical reading skills, such as encoding and decoding. This implies the preservation of the print-based autonomous literacy tradition significantly (cf. Street, 2003). On the other hand, the teachers in addition select technologies that, by their inherent features, expand the possibilities for creative and aesthetic narration with multiple means. What differs between the two practices is what the teacher directs her scaffolding towards. Thus, the way of scaffolding may indicate in which literacy approach the teacher grounds her instruction. Regardless of technology, through the organisation of the activities, as discussed above, the children are allocated space to interact and negotiate meaning rather than to individually perform reproductive tasks.

The immersion of new cultural tools, such as digital technology, in education challenges the tradition of literacy instruction as well as our perception of learning (Lantz-Andersson & Säljö, 2014; Säljö, 2010). The technology may alter our ways of reading and writing, but this does not imply that technologies produce anything by themselves or contribute to a storymaking on their own (Gattenhof & Dezuanni, 2015). It would be reductionist thinking to ascribe

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[37] Skoog's (2012) study did not include digital technologies but is relevant since it was conducted within the Swedish preschool class context.

one-sided agency to technology; "instead technologies are subjected continually to a series of complex interactions and negotiations", Selwyn (2012, p. 84) stated. His argumentation clearly supported the empirical findings of the present studies. This leads to the conclusion, that to not risk reducing implemented technology to a mere deliverer of repetitive curriculum content, it has to be purposefully, albeit innovatively used in early years literacy practices (Flewitt et al., 2015).

Policy, research and instructional challenges

Two factors governing preschool class practice are policy documents and the notion of a practice that rests on a scientific basis. What has been brought to light is the discrepancy between the formulation of policy texts (whose internal relation is sometimes contradictory) and research results. In an international perspective, the research field of early childhood literacy, regrettably, thus far, has had limited influence on the political view of early years practice, according to Gillen and Hall (2013). The reason, I suggest, could be that an increasing number of studies qualitatively examine young children's sensemaking in technology-mediated socially situated activities, rather than conducting surveys or quantitative randomised controlled experiments. The processes taking place within these social activities are by nature not measurable in terms of learning outcomes and therefore do not provide policy makers and politicians with findings that are easily transformed into curricula formulations. To a large extent, the OECD Pisa Test sets the frame for the policy discourse across Europe, and as a result, it tends to move towards an autonomous view of literacy, which may have implications for the education curriculum (Sefton-Green et al., 2016; see Resnick & Resnick, (1977) for a historical discussion). In the Swedish context, the trend appears to be more or less consistent with this.

As previously mentioned, since the present studies were conducted new reforms have been decided upon and changes at the policy level have been introduced. In addition, there are forthcoming changes that may have further significance for the practice and the assignment. One Government bill[38] (2017/18:195) with a proposal for implementation of a measure of guarantee applying to reading, writing and counting is at time of writing a subject of

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[38] The proposal is based on a committee report: *På goda grunder – en åtgärdsgaranti för läsning, skriving och matematik* [On good grounds – a measure of guarantee for reading, writing and mathematics] (SOU, 2016:59).

political consideration. The aim is the early identification of children who are unlikely to develop towards later knowledge requirements in years 1 and 3. In focus is the linguistic and mathematical awareness. As a basis for the measure of guarantee, a mandatory mapping is proposed, which The Swedish National Agency for Education has been assigned to develop. In contrast to Gillen and Hall's (2013) argumentation about politicians' disregard for research, in the assignment, it is stated that the mapping material will be based on a research review, in which one Swedish review conducted on behalf of the School Research Institute in 2015 is included (SOU, 2016:59). The review consists of studies on reading instruction largely grounded in the phonics tradition. Critical voices have previously claimed that the Swedish review unilaterally encompasses studies from one research tradition and not taking into account the whole language perspective, that is, a functional view of literacy, as a meaningful, social and communicative activity. Accordingly, it could be argued that the review that grounds the material present an incomplete picture of the knowledge available within the field and which may plausibly will have consequences for the design (to be published in July 2018). In a similar vein to Europe the drawn picture indicates a reinforced emphasis on traditional literacy (cf. Sefton-Green et al., 2016; also see Dyson, 2010). Thus, the danger, I argue, is that literacy instruction risks becoming instrumental. At the same time, I perceive that the revised curriculum from 2016 emphasises children's possibilities to develop general abilities, such as speech and written communication, problem-solving, creativity and critical thinking in relation to digital technology. Consequently, in my opinion, these conditional changes bring pressure and pedagogical challenges to teachers who are to find a balance between, on the one hand, arranging experience-based activities to develop children's general abilities, such as creativity and problem-solving, and on the other hand, supporting technical reading and writing skills. The questions many researchers within the early literacy field inevitably pose are: What counts as literacy in contemporary society, and what literacy competences do children need in a digital environment – not only in their future societal lives, but also for a meaningful childhood in the present?

Concluding remarks and further research

The findings of the present thesis indicate that several intertwined issues are at stake in the analysed literacy events. Prominent in the material is the connection

between the given institutional conditions and the children's opportunities to develop linguistic actions, narrative and digital skills in the *in situ* activity. As shown, the children's storymaking was mediated by the teachers' organisation of the activities, in terms of the setup of collaborative work, the introduction, the contingent scaffolding strategies and the selected technologies. The organisation of this child-centred approach provides a context for communicative experience-based actions, seemingly meaningful for the participating children. The inherent qualities of both the hardware and the software applications provide opportunities to creatively combine and explore different semiotic means, such as written language, images, colours and forms. Thereby they contribute to emotional and cognitive experience through aesthetics and symbolic thinking. However, while practicing their ability to collaborate, understanding and combining multiple semiotic means to make an intelligible story, children simultaneously must learn how to operate digital technologies, which, due to the design, proves to some extent to be demanding. Noticeable also is the obvious difficulties that arise for the children in the transformation between different means, for example, between the writing and the verbal, and between the visual art and the verbal. These difficulties cannot be attributed to the technologies alone, but are found in the relationship between what they make possible and the teacher's pedagogical goal, as well as to the governed laws of the semiotic means.

Taken together, the present studies coincide with research within the field concluding that teachers cannot be replaced by technologies (e.g., Lagerlöf, 2016), but have a decisive mediating role in how an instructed activity unfolds, an insight that by no means is new. Based on this argument and given that the digital technologies co-constitute the context as a mediating tool, a deliberation on why and how digital technologies should be used in early literacy education is necessary. The challenge in designing a pedagogical activity, I suggest, lies in finding an alignment between the intended learning goal, the introduction of concepts and technologies with suitable inherent design enabling learning about the specific content. This implies that a teacher's competence should encompass knowledge about the digital technology's benefits in relation to particular content. It further means finding a balance between the degree of detailed instruction and provision of space for the children to act independently based on their interests and experiences.

An increasing number of studies within the field of early childhood literacy have investigated technology-mediated activities in early education. However,

these studies tend to maintain a separate focus on the child and technology relation, or on adult and child interaction. In the search for relevant literature, I identified a research gap, in terms of a lack of empirical studies taking a holistic approach to the pedagogical situation, that is, investigating the relationship between all the interacting participants, the institutional setting, the digital technologies and other cultural tools. From a pedagogical perspective, it is important to gain a more in-depth understanding of the processes that occur in instructed storymaking technolgy-mediated *in situ* activities and the challenges raised in such. The present study has contributed to filling this gap. It could of course be argued that in-depth case studies of the kind conducted here are limiting in terms of generalisability. What I have empirically studied, however, is the phenomena in question, rather than, for example, making claims on the basis of an analysis of technology per se, or general claims about the digitalisation of the educational system. This is important for the ecological validity of the research. Thus, what is studied is a pedagogical practice, in the context of the preschool class, on its own premises.

The preschool class was introduced in the Swedish education system 20 years ago. During this period, this school form has had unclear guidelines; however, it is now facing several changes, for instance, through the implementation of a partially new curriculum. The supplement consists of central pedagogical content that is clearly academic-oriented and points out, amongst other things, the inclusion of digital tools and media for communication and creative work. Hitherto, the school form has been a subject of Swedish research to a limited extent, but the new guidelines give every reason for future research. For example, one potential object of study is how the new curriculum is transformed and accomplished by teachers and children in the practice. Additionally, it would be interesting to examine how the concept digital competence can be understood in relation to the six-year olds in this hybrid pedagogical context. Given that young children enter preschool and school with experiences from digital media texts, and that literacy from a sociocultural perspective involves the ability to communicate in a variety of genres, there is a need to further investigate how children develop their communicative skills when encountering different genres and how they evaluate and critically relate to these. These abilities are increasingly important in a digitalised society.

Chapter 7 Swedish summary

I detta avsnitt presenteras en svensk sammanfattning av avhandlingen.

Introduktion

Syftet med föreliggande doktorsavhandling är att bidra med kunskap om hur teknologi-medierade literacy-händelser, i form av berättande, konstitueras av barn och förskollärare inom förskoleklassens institutionella praktik. Forskningsintresset föranleds av att barns möte med text idag utan överdrift kan sägas vara starkt kopplad till digital teknologi[39]. Europeisk forskning visar att den ökade tillgången på datorer, datorplattor, mobiltelefoner och annan utrustning både i hem och utbildningspraktiker i allt större utsträckning genomsyrar ungas vardagliga liv (se bl.a. Plowman, Stephen & McPake, 2010; Sefton-Green, Marsh, Erstad, Flewitt, 2016). I Sverige framträder en liknande bild genom bland annat en rapport som presenterats av Statens medieråd (2017), vilken visar att barns medievanor i hemmet har förändrats betydligt sedan 2014, främst genom att allt yngre använder mobiltelefoni och allt fler i åldrarna 5–8 år är ute på internet. Digitaliseringen har även fått genomslag i det svenska utbildningssystemet, även om det finns variationer i landet, enligt statistik från Skolverket (2015). Exempelvis går det nu i förskolan 8,2 barn på varje dator eller platta jämfört med motsvarande 12,5 barn år 2012.

Inom forskningsfältet Early childhood literacy (Barns tidiga literacitet) betonar flera forskare att barns navigering på skärmen tidigt leder till möten och erfarenheter av digitala texter i vilka de engagerar sig (Fast, 2007; Larson & Marsh, 2013; Roswell & Harwood, 2015, Wohlwend, 2015). Dessa texter skiljer sig ofta från de som förekommer i traditionellt tryck-baserade literacy-praktiker genom att delvis vara rörliga och bestå av multipla symboler, tecken och ljud. Drivna av eget intresse och motivation använder barn sina erfarenheter av textmöten i lek och berättande (Dyson, 2001, 2003) i och mellan olika sociala

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[39] I likhet med skollagen och Läroplanen för grundskolan, förskoleklassen och fritidshemmet (Lgr11) används i avhandlingen den övergripande termen digital teknologi (eller i pluralis teknologier) för både hårdvara och mjukvaruprogram. I de empiriska studierna specificeras de specifika enheter och programvaror som används i varje studie.

praktiker. Därmed är de att betrakta som aktiva meningsskapande producenter snarare än passiva konsumenter av media, argumenterar Roswell och Harwood (2015). Mot bakgrund av detta resonemang framträder några nyckelfrågor inom Early childhood literacy-fältet. På vilka sätt transformerar dessa teknologiska förändringar barns literacy-aktiviteter i olika sociala sammanhang, vilka erfarenheter av digital text tar barn med sig in i klassrummet och vilka möjligheter ges de att använda dem i den tidiga läs- och skrivundervisningen?

Det engelska begreppet *literacy* har historiskt omfattat läsning och skrivning men mer ur ett färdighetsperspektiv. I samtida forskning har förståelsen av literacy breddats till att nu betraktas som socialt situerade och meningsskapande praktiker, vilka är kulturellt och historiskt konstituerade. Enligt Barton (2007) är det en svår uppgift att studera literacy-praktiker och han argumenterar därför för nödvändigheten att istället fokusera på observerbara och avgränsade *literacy-händelser*, eller *events* för att utifrån dessa få ledtrådar till hur den övergripande praktiken konstrueras med dess deltagare och involverade verktyg. I föreliggande avhandling förstås de studerade literacy-händelserna i relation till den större sociokulturella praktik där de utspelar sig, nämligen i förskoleklassen. I linje med Brice Heaths (1983/1996) definition av literacy-händelse inkluderar den en skriven text av något slag, dock förstår jag text även som involverande talat språk, gester, andra symboler, färger och bilder, som tillsammans bildar en innehållsmässig helhet.

Det finns flera sätt att närma sig läsande och skrivande i de tidiga skolformerna så som förskolan och förskoleklassen. Exempelvis har berättargenren traditionellt använts som ett medel att engagera barn i språkliga handlingar (Björklund, 2008; Wells, 2009) då berättelsen vanligtvis utgör en framgångsrik länk till barns vardagliga livsvärldar (Gattenhof & Dezuanni, 2015). För Bruner (1996) har berättandet en mer specifik roll som redskap för tänkande, meningsskapande och kommunikation i sociala sammanhang, vilket även är en premiss i föreliggande avhandling. En berättelse kan uttryckas med olika semiotiska redskap vilka erbjuder skilda meningsbärande potentialer (Wright, 2011). För yngre barn kan en transformering mellan dessa sätt, exempelvis mellan tal, skrift och visuella uttryckssätt, innebära utmaningar och vara en mödosam lärprocess. Vilka semiotiska uttryckssätt som tillämpas av de deltagande barnen i studierna är ett av avhandlingens intressen.

Forskningsstudier av teknologins betydelse för utveckling av literacy färdigheter och berättande i förskolan och skolan ger en tvetydig bild. Det finns kvalitativa studier som visar hur användning av datorer eller applikationer kan

förbättra olika aspekter av barns läs- och skrivfärdigheter, såsom ökad vokabulär (Sandvik, Smørdal & Østerud, 2012), ökad textproduktion och genremedvetenhet (Hultin & Westman, 2013) och utvecklat berättande (Klerfelt, 2007). En motsatt bild ger viss neurovetenskaplig forskning som hävdar att skrivbaserade aktiviteter för "hand" gynnar literacy-utvecklingen jämfört med skrivande på tangentbord (t.ex. James & Engelhart, 2012). Hur den pedagogiska praktiken konfigureras vid implementering av digital teknologi är följaktligen ett område vi behöver få mer kunskap om genom fortsatt forskning. Detta gäller särskilt förskoleklassens praktik som är en del i det förändrade utbildningssystemet, dels på grund av digitaliseringen, men även på grund av andra politiska reformer. Efter det att avhandlingens empiriska studier genomförts har exempelvis läroplanen för grundskolan, förskoleklassen och fritidshemmet reviderats med ett nytt avsnitt som anger förskoleklassens syfte och innehåll (Skolverket, 2016). Från och med 1 juli 2018 blir den dessutom obligatorisk för alla sexåringar.

Syfte och frågeställningar

- På vilket sätt medierar digitala teknologier, andra kulturella redskap och lärarens stöttning barnens berättande?
- Vilka utmaningar i undervisningen uppstår i teknologi-medierade aktiviteter i förskoleklassen?

Teoretisk utgångspunkt

Avhandlingen tar sin utgångspunkt i en sociokulturell syn på lärande som en konsekvens av det meningsskapande som sker i socialt och kulturellt inbäddade aktiviteter. Det teoretiska perspektivet har många förgreningar och därför har jag valt att avgränsa mig till framförallt två forskares arbete vilka särskilt betonar de kulturella redskapens roll, som exempelvis språk, symboler och fysiska redskap, för människans handlingar: Säljö (2000, 2015) och Wertsch (1998, 2007). En teoretisk premiss är att människan inte står i direkt kontakt med omvärlden utan hon skapar mening, tolkar och agerar i den via kulturellt utvecklade redskap (Säljö, 2000; Vygotskij, 1978, 1987; Wertsch, 2007). För att analytiskt förstå hur detta sker används det centrala begreppet *mediering* i

studierna. Lärande förstås vidare som situerat i en kontext, vilket innebär att vad och hur vi lär (utvecklar våra kognitiva och kommunikativa förmågor) är till stor del beroende av var vi är (vilka möjligheter vi har att interagera med andra) och vilka redskap som finns att tillgå och hur vi använder dem. Dessa förehavanden medverkar dynamiskt till att konstruera kontexten (Daniels, 2001). Utifrån detta perspektivs epistemologi impliceras således att ett barns lärande kan beskrivas i termer av dess förmåga att använda olika redskap på ett socialt och kulturellt ändamålsenligt sätt (Razfar & Gutiérrez, 2013). Som en konsekvens av detta resonemang handlar institutionell undervisning, eller lärarinitierade målstyrda processer, om vilka kulturella redskap som introduceras och vilka möjligheter barn har att utveckla användningen av dem i ett socialt sammanhang.

Baserat på denna förståelse är avhandlingens analysenhet, en redskapsmedierad aktivitet, vald för att bevara de karaktärsdrag som kännetecknar en berättaraktivitet i förskoleklassen. Begreppet *aktivitet* (eller literacy-händelse) är avgränsad till att vara initierad av någon, att ha en observerbar början och ett slut. Å ena sidan interagerar deltagarna med aktivitetens ramar genom sina handlingar, såsom kommunikation, utbyte av erfarenheter och kunnande och materiella redskap såsom datorer, symboler, bilder, ljud. Å andra sidan samspelar aktiviteten med deltagarnas handlingar och därför kan aktiviteten och handlingarna sägas konstituera varandra.

Språk och meningsskapande

Ett centralt kulturellt redskap för människans tänkande och lärande är språket, det talade och det skriftliga. Språk förstås som en kommunikativ resurs – en länk mellan det individuella tänkandet och andra individer – som ständigt är i förändring beroende på omständigheter och behov (Säljö, 2000). Dess användningsområde är flera, bland annat har språket en utpekande funktion som innebär att objekt och dess karaktäristika kan namnges. Dess semiotiska (teckenbärande) funktion återfinns i relationen mellan ett språkligt uttryck och det objekt eller fenomen som uttrycket refererar till eller den mening uttrycket signalerar (Säljö, 2000). I denna relation finns utrymme för tolkning och förhandling av det sagda (Olsson, 1994). Med utgångspunkt i Vygotskijs syn på språk, ses det som en handling snarare än ett formellt system (Wertsch, 2008). I linje med denna uppfattning antas i avhandlingen ett vidare perspektiv på

språk som inkluderar gester, annat kroppsliga uttryckssätt såsom intonation och blickar.

Hittills i denna sammanfattning har begreppet meningsskapande använts. Det måste klargöras att Vygotskij (1987) skiljde mellan begreppen 'meaning' och 'sense'. Meaning förstås av Vygotskij som en lexikal, stabil, kulturellt och socialt överenskommen förståelse av ord. I motsats till detta är 'sense' enligt Vygotskij dynamiskt till naturen på grund av individers tolkningar av specifika situationer där de befinner sig. På svenska skulle 'meaning' kunna jämföras med 'betydelse', då i mer generell bemärkelse, och 'sense' till det som sker lokalt, det vill säga där ords innebörd ges mening i ett konkret sammanhang, förklarar Säljö (2000). Medan Bruner (1996) endast brukade termen 'meaning-making', lyfte han liknande Vygotskij betydelsen av det situerade och förhållandet mellan kulturnivå och individnivå. Enligt min förståelse gjorde Bruner poängen att vi i vår strävan att förstå den specifika situationen vi är involverade i, relaterar till de kulturella konventioner och gemensamma sociala erfarenheter som omger oss. I de föreliggande studierna har denna premiss väglett analyserna av hur barnen skapar mening under berättandet och vilka kulturella redskap de använder.

Narrativ - ett kulturellt redskap

Som tidigare nämnts används den narrativa genren ofta i förskolan och tidiga åren i skolan som ett sätt att engagera barn i språkliga handlingar och i läsning och skrivning (Fast, 2007; Klerfelt, 2007; Wells, 2009). Detta är inte överraskande då genren historiskt har tillskrivits många funktioner som exempelvis redskap för kommunikation, minnande, kulturbärare och kunskapsförmedlare (Bruner, 1996; Wertsch, 1998). Att berätta blir på så vis ett sätt att organisera våra tankar och erfarenheter, vilket inbegriper ett annat språkbruk än det som förekommer i exempelvis ett vetenskapligt samtal (Bruner, 1996). Att vara en kompetent berättare innebär bland annat förmågan att arrangera sekvenser av händelser i en sammanhängande (inte nödvändigtvis kronologisk) och begriplig ordning, innehållande en introduktion och ett avslut. Vidare kretsar en berättelse vanligtvis kring en konflikt/problem som ska lösas av en karaktär i en viss miljö (Bruner, 1996). Som ett analytiskt begrepp anger genren en särskild typ av text (muntligt eller skriftligt) som representerar världen på ett visst sätt med särskilda egenskaper (Bruner, 1996). Att vara medveten om

och kunna skilja olika genrer åt är en viktig aspekt av literacy, argumenterar Olson (1994). Denna kompetens och att kunna berätta är något som utvecklas genom deltagande i sociala sammanhang och genom användning av kulturella redskap och strukturerande resurser som språket, visuella symboliska representationer (bilder eller grafik) och digital teknologi.

Strukturerande resurser

Det sätt vi agerar eller löser en uppgift på, i en viss aktivitet, beror på vilket syfte vi vill uppnå och vilka relevanta *strukturerande resurser* som kan tas i bruk (Lave, 1988; Säljö, 2000). Den centrala tanken hos Lave är att en och samma aktivitet, exempelvis en matematisk uppgift, löses på olika sätt beroende på den situationella omständigheten och de strukturerande resurserna som primärt tas i bruk utifrån erfarenheter av liknade situationer. Det vill säga erfarenheter som härrör från andra liknande situationer spelar in och bidrar till hur arbetet struktureras för att lösa uppgiften. Dessa resurser, som kan utgöras av erfarenheter av en särskild institutions rutiner och kommunikationsmönster eller hemkultur, utgör stöd för våra tankar och utförande av handlingar i aktiviteten (Lave, 1988). Strukturerande resurser förklarar Säljö (2000), är en väsentlig del i vårt lärande att identifiera viktiga egenskaper i en aktivitet och kunna agera i enlighet med dessa. I den tredje studien undersöks vilka resurser barnen använder för att strukturera berättandet.

Intersubjektivitet

Intersubjektivitet är ett generiskt mänskligt särdrag då vi tenderar att orientera oss mot andra för att interagera. Begreppet är svårfångat men jag förstår det utifrån Rommetveit (1974, 1998) och Linells (2014) framskrivningar. För forskning med ett interaktionellt analytiskt intresse är det viktigt att försöka klargöra hur intersubjektivitet upprättas mellan individer som deltar i en aktivitet. Intersubjektivitet kännetecknas av både medvetna förhandlingar och omedvetna förgivettagna antaganden om gemensam upplevd erfarenhet och kunskap. Dessa antaganden är enligt Rommetveit (1974) en förutsättning för att deltagande individer kan synkronisera sin uppmärksamhet och skapa mening i en situerad kontext. Antaganden innebär en ömsesidig överenskommelse om

vad som menas med det som sägs (Linell, 2014). Ord, fraser och symboliska gester måste tolkas kontextuellt av individerna på ett liknande sätt även om de hänvisar till föremål eller händelser utanför situationen. Som vi vet uppfattar dock inte människor saker på exakt samma sätt eftersom det är avhängigt deras sociala och kulturella bakgrund och därför kan de inte heller dela fullständig erfarenhet eller kunskap. Av den anledningen kan intersubjektivitet uppnås endast delvis och temporärt (Linell, 2014; Rommetveit, 1974, 1998). För att deltagare i en aktivitet ska kunna utföra en uppgift i interaktion måste de synkronisera sin uppmärksamhet och skapa vad Rommetveit (1998) kallar tillräcklig intersubjektivitet för att möjliggöra en fortsättning av aktiviteten. Vid tillfällen då individerna upptäcker en avvikelse i den gemensamma förståelsen leder det till omförhandling av mening för att därigenom: "maintaining agreement about the topic and purpose of their talk" (Wells, 2007, p. 253). Faktum är, argumenterar Linell (2014), att interaktion inte handlar om att enbart nå enighet då vi har olika intentioner, intressen och kunskaper som vi tar med oss in i en aktivitet. Det är i själva verket i upptäckten av dessa diskrepanser som nya idéer föds (Rommetveit, 1998) och lärande kan äga rum. Om en sådan kritisk händelse inträffar i en pedagogisk situation uppstår en möjlighet för läraren att förstå var barnet befinner sig i sitt lärande och kan därmed besluta om gynnsammaste stöttning. I avhandlingen undersöks spår av deltagarnas muntliga eller icke-verbala yttranden för att utröna huruvida de lyckas att tillfälligt etablera tillräcklig intersubjektivitet för att fortsätta det gemensamma berättande.

Scaffolding

Begreppet *scaffolding* är vanligt förekommande i diskussioner och analyser av pedagogisk art och har delvis kommit att omfatta all sorts lärarhjälp eller används som en undervisningsstrategi (Elbers, Rojas-Drummond & van de Pol, 2013). Begreppet har sitt ursprung i Wood, Bruner och Ross (1976) studier av mödrars stöttning av deras barn vid blockbyggande. I analys av interaktionen kunde forskarna urskilja att det som de metaforiskt benämnde scaffolding i huvudsak handlade om den vuxnes tillfälliga kontroll av moment som ligger bortom barnets kompetens (Wood et al., 1976). Trots att forskarna fann ytterligare nyckelaspekter för vad som karaktäriserar scaffolding betonar Howe (2013), Mercer och Littleton (2007), van de Pol och Elbers (2013), samt

Warwick, Mercer och Kershner (2013) att det inte finns någon entydig definition inom forskningsområdet. van de Pol, Volman och Beishuizen (2010) exempelvis pekar ut tre aspekter: kontingens, avtagande och ansvarsöverföring. Ur ett sociokulturellt perspektiv är inte scaffolding någon ensidig lärarstrategi utan man argumenterar istället för att i en pedagogisk praktik finns det utrymme för förhandling mellan läraren och barnet/barnen eftersom barnen antas vara aktiva deltagare. Scaffolding förstås således som en fråga om fördelning av arbete. För att förstå hur deltagare skapar mening och ömsesidig förståelse bör begreppet inbegripa det språk och symboler som används konkluderar Elbers, Rojas-Drummond och van de Pol (2013). Daniels (2001) argumenterar kritiskt för att scaffolding tenderar att förstås mer i termer av distribution mellan människor än mellan människor och artefakter. En pågående diskussion bland forskare visar att begreppet behöver omdefinieras i relation till digitaliseringen av klassrummet (jfr Englert m.fl., 2004; van de Pol & Elbers, 2013; Warwick m.fl., 2013; Yelland & Masters, 2007). Föreliggande avhandling ansluter sig till den diskussionen genom att analysera hur lärarna stödjer barnen genom organiseringen av berättaraktiviteter, exempelvis genom val av teknologi med dess inbyggda resurser i mjukvarorna, men även genom instruktion och deltagande.

Kreativitet och estetiska omdömen

Begreppet *kreativitet* används i en av avhandlingens studier för att förstå hur barnen skapar berättelser och vilken källan till innehållet är. Varje mänsklig handling som ger upphov till något nytt är en kreativ handling skrev Vygotskij (2004). Själva källan för det 'nya' som en individ skapar återfinns i dess tidigare erfarenheter och det är förmågan att kombinera gamla fragment till något nytt som "ligger till grund för kreativiteten" förklarade Vygotsky (2004, s. 12, min översättning). Hos unga visas denna kreativa process främst i lek och i deras berättelser där upplevda känslor och händelser i exempelvis familjen återanvänds och remixas för att konstruera något fantasifullt nytt som då endast tillhör barnet (Vygotskij, 2004). Utifrån detta resonemang är det möjligt att hävda att när barn interagerar med andra kan de få tillgång till deras erfarenheter, vilket medför ett ökat antal källor att hämta material ur. Även i aktiviteter där barn kreativt kan engagera sig i att kombinera element och olika

representationssystem (Siraj-Blatchford & Siraj-Blatchford, 2011) kan ett värdefullt lärande bli möjligt (Lobman, 2010).

Hur kan då begreppet *erfarenhet* förstås? Enligt Deweys (1934/1980) filosofiska tankar om erfarenhet befinner sig människor i ett kontinuerligt flöde av erfarenheter som ständigt avlöser varandra. Vad vi upplever vara en särskild minnesvärd erfarenhet skiljer sig från erfarenheter i allmänhet genom att 'sticka ut' från vad som hänt tidigare och kommer att hända senare skrev Dewey. Vi upplever *en* erfarenhet när den förväntan på vad som komma ska, exempelvis en handlings konsekvenser, slutligen når fulländning och fullbordar hela upplevelsen. Det är då möjligt att namnge erfarenheten med något som kännetecknar den, som exempelvis "den där måltiden" (Dewey, 1934/1980). Människors handlingar häri involverar både tänkande, värderingar och bedömningar men även sinnen, såsom syn och hörsel som bidrar till njutning och andra känslor (Dewey, 1934/1980). I detta avseende har en erfarenhet estetiska egenskaper. Avhandlingen bygger på antagandet att en berättaraktivitet kan utgöra en estetisk erfarenhet där deltagarna bedömer det kreativa arbetet i enlighet med uppskattning och smak. I studie IV riktas analysen särskilt mot yttrade estetiska värdeomdömen vid de tillfällen då de uttrycker en förväntan på uppföljande handlingar och vilka konsekvenser dessa uttalanden har för den fortsatta aktiviteten.

Tidigare forskning

Att placera en studie inom ett specifikt forskningsfält kan visa sig problematiskt då forskningsobjektet kan övergripa flera fält, som i fallet med föreliggande avhandling. Här riktas intresset mot teknologi-medierade berättaraktiviteter inom förskoleklassens literacy-praktik, vilket potentiellt skulle kunna innebära en adressering till flera forskningsfält. Dock har en avgränsning gjorts mot särskilt två områden. Då avhandlingen tar ett berättarperspektiv inkluderas litteratur inom det narrativa fältet och särskilt kvalitativa studier som fokuserar på barns berättande i pedagogisk praktik. Det andra valet, fältet early childhood literacy, är motiverat av behovet att undersöka barns erfarenheter och användning av digitala texter som väsentligt förändrar deras vardag.

En förändrad syn på barns berättande

Forskning om berättelser producerade av barn har främst utvecklats inom discipliner såsom psykologi och lingvistik och med en övervägande analytisk

inriktning på berättelsernas uppbyggnad (Nicolopoulou, 1997). Dessa formalistiska studier har bidragit till insikter om den generiska berättelsens struktur och om barns utveckling av språkliga färdigheter i relation till berättande. Dock har forskningen praktiskt taget förbisett barns symbolhandlingar i samband med berättande, hävdar Nicolopoulou (1997). Hon föreslår att för att öka förståelsen för barns symboliska handlingar bör man integrera aspekter som struktur och innehåll och samtidigt studera de sammanhang i vilka berättelser skapas. Genom att anta ett sådant angreppssätt kan vi även få syn på barns sociala och kulturella erfarenheter (Khimji & Maunder, 2012) och deras uppfattning om världen (Nicolopoulou, 1997).

Årtionden av forskning har visat på betydelsen av muntligt berättande för att stödja barns literacy-utveckling (Theobald, 2016). När barn engagerar sig i interaktiva berättaraktiviteter, både som berättare och som lyssnare, ökar deras möjligheter att bland annat utveckla en metaspråklig förmåga (se Letnes, 2014). Att ta del av historier i böcker skapar nya erfarenheter och breddar barns omvärld men de erfarenheterna representeras på ett annat abstrakt sätt än genom det muntliga - genom skriften (Wells, 2009). Genom att möta språk både muntligt och i skrift upptäcker barn så småningom att språket utgör ett semiotiskt eller ett "symboliskt sätt att representera" något och detta utgör ett viktigt steg i förståelsen av alfabetssystemets principer betonar Wells (2009, s. 220, min översättning).

Den narrativa genren i pedagogisk praktik

I förskolan och de tidiga åren i skolan fyller den narrativa genren många funktioner och ses som en brygga till literacy. Studier inriktade på denna relation ökar i antal, dock är den interaktionella aspekten av barns berättande fortfarande underbeforskad. Genom studier i pedagogisk praktik av van Oers, (2007) och Theobald (2016) får vi insikt i hur barn utvecklar narrativ kompetens i kollaborativt berättande. van Oers (2007) definierar narrativ kompetens som förmågan att i en social kontext konstruera meningsfulla textuella representationer, vilket inkluderar produktion av sammanhängande verbala eller skriftliga yttranden. Båda forskarna lyfter betydelsen av att kunna inta både berättarens och lyssnarens position för att på så sätt bidra till det gemensamma projektet. Oavsett om det rör sig om muntligt eller skriftligt berättande länkar barn sina yttranden till ett överenskommet ämne. Flera andra studier visar att

barns personliga erfarenheter och innehåll hämtat från populärkulturen utgör källor och bildar en gemensam plattform och förståelse som medierar berättandet (se t.ex. Dyson, 2001, 2003; Fast, 2007; Marsh m. fl., 2005, 2010; Roswell & Harwood, 2015; Urbach & Eckhoff, 2012, Wright, 2011). Det överenskomna ämnet modifieras och expanderas på ett associativt sätt genom förhandling av nya predikat (van Oers, 2007), exempelvis Batman är *stark*. En berättelse upprätthålls och förs framåt av språkliga markörer som konjunktionerna och, också, när, sen (Taube, 2011; Theobald, 2016) men även genom animerade röster, ansiktsuttryck, gester och andra kroppsliga uttryck (Theobald, 2016). I förskolan är bild-drivna berättaraktiviteter vanliga där färg, form och komposition används för att uttrycka mening (Coates & Coates, 2006; Wright, 2011: Änggård, 2005). Den estetiska aspekten i dessa interaktiva aktiviteter tycks dock föregå det narrativa (Holm Hopperstad, 2008; Änggård, 2005). Att lära sig att berätta handlar således inte endast om att strukturera händelser utan också om att förstå och behärska språkligt och symboliskt innehåll (Wells, 2009).

Studier visar att barn i social interaktion gradvis bygger upp, eller approprierar kunskap om berättandets konst. Genom att studera de narrativa yttrandena kan vi få syn på barnens lärande och därmed kunna stötta dem där de befinner sig (van Oers, 2007). I förskolan/förskoleklassen blir lärarens roll betydelsefull (Björklund, 2008; Pramling & Eriksen Ødegaard, 2011; Wells, 2009). En pedagogisk praktik för yngre barn tenderar att vara tematisk organiserad med lekfulla aktiviteter, både spontana och arrangerade, där berättande, skrivande och läsande ses som meningsfulla kommunikativa redskap. (Det finns även forskning som visar en annan kontrasterande bild av förskoleklassen, t ex. Skoog, 2012). Med ett sådant didaktiskt förhållningssätt ges möjligheter för lärare att stötta barns egna berättelser både kognitivt och känslomässigt. I en empirisk studie i en norsk förskola visas hur en lärare scaffoldar yngre barn i att skapa sammanhängande berättelser av både vardagligt slag men även fiktiva sådana genom att plocka upp deras yttranden och ställa frågor som ger kontextuella band till både dåtid och nutid (Pramling & Eriksen Ødegaard, 2011). På så sätt riktas fokus mot en berättelses temporalitet. Läraren ger också förslag på nya element såsom karaktärer, händelser och platser för att expandera historien och således rikta uppmärksamhet mot nyckelaspekter av en narrativ komposition (Pramling & Eriksen Ødegaard, 2011). Under denna typ av interaktiva process ger stöttningen barnet möjligheter att utveckla

generaliseringar och därmed utveckla en högre form av tänkande (Sandvik, Smørdal & Østerud, 2012).

Digital teknologi i early literacy-klassrummet

Forskningsfältet early childhood literacys formerande följer den historiska utvecklingen inom literacy-fältet i stort. Övervägande studier som utförts inom fältet har hittills framför allt återspeglat en psykologisk-kognitiv modell av literacy (Burnett, 2010; Lankshear & Knobel, 2003). Det innebär att studierna är baserade på antagandet att läsning och skrivning är en individuell aktivitet och som utvecklas på ett universellt och linjärt vis. Emellertid förstås literacy alltmer som en kommunikativ och meningsskapande aktivitet beroende av social interaktion. Vad som kommit att kallas den sociala vändningen har för forskningen lett till metodologiska konsekvenser och annan analytisk inriktning. Från att studera barns tekniska läs- och skrivfärdigheter under experimentella förhållanden intresserar sig nu forskare för barns literacy-praktiker i naturligt förekommande sociala, kulturella och institutionella sammanhang (t ex. Brice Heath, 1983/1996, Wells, 2009). Detta angreppssätt bidrar till en förståelse av literacy som mångfasetterad. I relation till den digitala teknologins position i klassrummet återspeglas de olika antagandena i viss mån fortfarande (Burnett, 2010). I en litteraturöversikt identifierade Burnett (2010) tre kategorier av studier som positionerar teknologin som en leverantör av literacy, teknologi som plats för interaktion runt text och teknologi för meningsskapande. Föreliggande avhandling följer denna kategorisering men förstår dem som delvis överlappande.

Studier som placeras in i kategorin *teknologin som leverantör av literacy* riktar forskningsintresset främst mot resultat av lärande snarare än mot processer i pedagogiska praktiker. Burnett (2010) argumenterar för att i dessa studier finns ett antagande om att teknologin *per se* överför literacy. Tre forskningsöversikter som spänner över 1960 till 2009 (Burnett, 2010; Labbo & Reinking, 2003; Lankshear & Knobel, 2003) visar att den övervägande andelen studier utförda under denna tidsperiod fokuserar på teknologi som stödjer utveckling av vad som kan relateras till en text-baserad literacy och som kan karaktäriseras som "skill-and-drill"-övningar av exempelvis fonem/grafem-relation. Sammantaget visar forskningen en delvis tvetydig bild om teknologins betydelse för barns lärande. Dock finns tecken på dess potential hävdar Labbo och Reinking (2003),

exempelvis ökar ordbehandlingsprogram i allmänhet barns skrivande i termer av längre texter. Detta visar även nyare svenska studier med tillägget att skrivandet blir mer processinriktat och texter därmed mer språkligt bearbetade (Agélii Genlotte & Grönlund, 2013) samt omfattar en större variation av genrer (Hultin & Westman, 2013).

I kategorin *teknologi som plats för interaktion runt text* återspeglas en sociokulturell syn på literacy och med antagandet att barns engagemang i digitala texter både är färgade av och bidrar till klassrumskulturen (Burnett, 2010, s. 257). Fokus riktar sig mot barn-barn interaktion runt datorn och textskapande medan lärarens närvaro i stor utsträckning utelämnas i studierna eller att barn och lärare studeras separat. I min litteratursökning framgår det att mönstret till stor del kvarstår. Forskning från 1980-talet och 1990-talet indikerar att datorer potentiellt kan förbättra barns interaktion i literacy-aktiviteter eller när datorn är en del av lek (Labbo & Reinking, 2003). Nyare studier visar det motsatta, det vill säga att barns interaktion är begränsad. Det finns ett antagande att interaktion runt skärm per automatik stimulerar språk och att barn lär av varandra. Plowman m. fl. (2010) visar emellertid i empiriska studier att det sällan finns något utforskande samtal mellan förskolebarn utan lärarens närvaro. Snarare tenderar det att vara en kommunikation präglad av förhandling om tillgång till datorn. På liknande sätt använde barnen i Jernes (2013) studie vad hon betecknar ett "fattigt" språk, som ofta består av korta uttalanden och frågor. Bristande interaktion och avsaknad av ett utvidgat samtal kan även bero på mjukvarans eller datorspelets design och innehåll (Petersen, 2015; Roberts-Holmes, 2014). I ett kontrasterande exempel av Wohlwend (2015) används en datorplatta och en 'öppen' berättarapplikation som erbjuder de observerade förskolebarnen en meningsfull multimodal textproduktion i vilken de engagerar sig genom samarbete och förhandling. Flewitt, Messer och Kucirkova (2015) noterar likaledes att datorplattans bärbarhet tycks erbjuda barnen möjligheter till kollaborativt skapande men även orsaka frustration över tillgång, tekniska problem och att inte förstå innehållet i applikationerna. Alla studier som diskuteras pekar på lärarens betydelse när barn interagerar runt skärmen, som förebild under textskapande och fysiskt med teknologin (Klerfelt, 2007), genom att ställa frågor och sätta ord på handlingar (Jernes, 2013) och samtala kring objekt som bidrar till ökad förståelse av kommunikativ interaktion och literacy (Sandvik m. fl., 2012).

I kategorin *teknologi för meningsskapande* återfinns endast ett fåtal studier vilka undersöker yngre barns användande av digitala texter i meningsskapande syfte

(Burnett, 2010). Studierna fokuserar antingen på barns egen textproduktion eller på deras konsumtion av text och det sociala sammanhanget beaktas i varierande grad (Burnett, 2010). Värt att notera är att studierna i min sökning utgår från social semiotisk teori som tenderar att fokusera på förhållandet mellan semiotiska teckens form och innehåll eller mellan barns teckenskapande och själva produkten. Utifrån teorin är transmedieringsprocessen mellan olika semiotiska uttryckssätt grundläggande för meningsskapande och eftersom det implicerar problemlösning innebär det möjligheter till lärande (Mills, 2011). Ur ett sociokulturellt perspektiv däremot förutsätts ett deltagande i social interaktion för att få förståelse för hur ett visst innehåll kan skapas och kommuniceras genom kombination av olika semiotiska teckensystem (Letnes, 2014). Studierna i kategorin undersöker hur barn skapar mening i multimodala digitala produktioner med inspiration från andra konstformer (Letnes, 2014), analoga och digitala texter (Mills, 2011; Rowsell & Harwood, 2015) och öppna applikationer (Sakr, Connelly & Wild, 2015). Både Letnes (2014) och Rowsell och Harwood (2015) fann spår av tecken och symboler från andra medier i barnens digitala produktioner, om än annorlunda representerade. Från analysen av barnens digitala produkter och deras kommentarer till arbetet, konstaterar Mills (2011) att de i allmänhet anpassar sig till de semiotiska principerna och lyckas hantera transformeringen mellan dem. Men då det inte finns någon en-till-en-korrespondens i deras meningserbjudande orsakar det ibland problem, hävdar hon. Även de lite yngre barnen i Rowsell och Harwoods (2015) studie förstår att exempelvis bilder har vissa meningserbjudanden medan ord har andra. Sakr m. fl. (2015) visar i sin studie att på vilket sätt de semiotiska uttryckssätt som teknologin erbjuder, exempelvis färg och symboler, används och vad det genererar på skärmen föregår innehållet i barnens muntliga berättande.

Studiens metod

I detta avsnitt redogörs för studiens design, och kontext, datainsamlingsmetod och bearbetning av det empiriska underlaget.

Studiens design och kontext

Föreliggande studier är utförda i två kommunala skolor i utkanten av en mindre stad i Sverige. Skolorna, Parkskolan[40] och Nya Skogsskolan, valdes ut med anledning av deras medverkan i ett kommunalt projekt – *Skriva sig till läsning med datorn*. På Nya Skogsskolan genomfördes dessutom ett lärarinitierat arbete med olika berättaraktiviteter, vilket var av intresse för en av delstudierna. De två deltagande förskollärarna har i olika grad fortbildat sig inom ramen för det kommunala projektet. Tre förskoleklassgrupper om sammanlagt 20 sexåringar deltog då de i par skapade digitala berättelser med olika typer av teknologi. 16 av dessa barn videofilmades. Genom bland annat det kommunala projektet hade barnen viss erfarenhet av datoranvändning och alla tre grupper hade tidigare arbetat med narrativ konstruktion på olika sätt.

Olika digitala teknologier, både hårdvara och mjukvaruprogram användes i de tre gruppernas berättaraktiviteter. I det kommunala skrivprojektet används bärbara datorer och tre mjukvaruprogram: ett ordbehandlingsprogram *Liber Office*, och två talsyntesprogram *Talande tangentbordet* och *Vital*. Dessa mjukvaror är särskilt utvalda för att stödja barnens begynnande skriftspråkande genom stavningskontroll och auditivt stöd. Den första gruppen på Parkskolan använde dessa print-baserade teknologier. Grupp två, också den på Parkskolan, använde ett program särskilt designat för berättande, *Storybird*, vilket kan sägas vara innehållsbaserat då det erbjuder ett stort antal illustrerade bilder som utgångspunkt för skrivande av berättelser. Den tredje gruppen sexåringar på Nya Skogsskolan skapade berättelser på en interaktiv skrivtavla med touch-funktion och med mjukvaruprogrammet *Notebook* som erbjuder ett verktygsfält med pennor, radergummi och en färgpalett. Notebook är inte designat för att specifikt stödja berättande såsom Storybird utan erbjuder ett öppet gränssnitt vilken läraren i studien dock begränsade genom att dela in skärmen i fyra rutor för barnen att skapa i.

Val av metod och analys

Valet av metod för att studera de situerade berättaraktiviteterna föll på videoobservation. Metoden möjliggör en rik dokumentation av den interaktion och det meningsskapande som sker mellan deltagarna, de digitala teknologierna och andra kulturella redskap (se t.ex. Heath, 2011; Stephen & Plowman, 2008).

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[40] Fingerade namn

Totalt spelades 16 berättaraktiviteter in vilka inkluderade lärarnas instruktion. Tillsammans omfattar det genererade materialet sammanlagt 12 timmar och 23 minuter[41] film. Vid de två första inspelningarna användes en kamera på stativ riktad mot ett par barn diagonalt från sidan för att fånga deras ansikten men även något av skärmen. Vid de övriga inspelningstillfällena användes två kameror på stativ, en riktad mot deltagarnas ansikten och en riktad mot datorerna eller den interaktiva skrivtavlan för att tydligare kunna dokumentera skeenden på skärmen. Delar av filmerna sattes sedan samman och synkroniserades (bild-i-bild) i iMovie. Detta tillvägagångssätt underlättade analys av samspelet mellan deltagarna och teknologin. Det empiriska materialet utgörs även av 15 stycken insamlade digitala berättelser.

Ett transkriptionsarbete kan vara utmanande när videodata skall transformeras till ett textbaserat medium (Linell, 1994; Plowman & Stephen, 2008). Tal, intonation, gester, ansiktsuttryck och ljud är några av de många kommunikativa uttryckssätt barn använder i sitt berättande, vilket bidrar till dessa utmaningar. I föreliggande avhandling har transkriptionen av filmerna utförts på olika nivåer och i varierande omfattning beroende på studiernas frågeställningar. Fokus har dock varit barnens och lärarens yttranden och andra handlingar och aktiviteterna på skärmen enligt Interaktionsanalysens principer (Jordan & Henderson, 1995). En transkriptionsnyckel inspirerad av konversationsanalys (t.ex. Goodwin & Heritage, 1990) har delvis använts för att på ett noggrant och sensitivt sätt kunna beskriva deltagarnas sekventiella turtagning (Studie I och III). För god läsbarhet valdes en vertikal skriptmodell (se Ochs, 1979) som inkluderar deltagarnas tal men även deras kroppsrörelser.

Genom att följa Interaktionsanalysens principer (Jordan & Henderson, 1995) har analysarbetet skett iterativt genom att omväxlande i processen studera både videomaterialet och transkriptionerna för att finna mönster i deltagarnas meningsskapande. Interaktionsanalysens mål är att identifiera mönster i människors vardagliga samtal i en specifik villkorad kontext, det vill säga hur ett yttrande tas emot och förstås eller negligeras (Jordan & Henderson, 1995). Utifrån dessa principer tillämpas grundantagandet att minst tre talturer inkluderas i analysen för att kunna beskriva vad som står på spel. Människors kommunikation med andra är sällan enbart tal-drivna utan inkluderar även

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[41] Tidangivelsen avser inspelad orginalfilm. I artikel II och IV anges annan tid och avser bearbetad film av olika vinklar.

gester, blickar, ljud och redskap. Vid studie av barns berättaraktiviteter blir dessa multimodala uttryckssätt betydelsefulla för analys av barnens och lärarnas koordinerande av interaktionen och hur de på så sätt etablerar nödvändig intersubjektivitet för att kunna gå vidare med uppgiften. Därför vidgas analysen till att även omfatta deras erfarenheter samt de redskap, såsom digital teknologi, som används inom aktiviteterna (Raudaskoski, 2006).

I studie II analyserades även åtta stycken berättelser, vilka skapades utifrån bilder tillhandahållna av programmet *Storybird*. Inledningsvis kategoriserades de fiktiva berättelserna och tre stycken valdes ut för att representera de variationer av en narrativ genre som upptäcktes. Dessa analyserades avseende innehåll och struktur, såsom handling, karaktärer, miljö, och tidsaspekt (Bruner, 1996). Då berättelserna ses som exempel på bilderböcker har Nikolajevas och Scotts (2001) terminologi använts i analysen av relationen mellan bilderna och de skrivna texterna.

Delstudierna och deras resultat

Studie I: 'Once upon a time there was a mouse': Children's technology-mediated storytelling in preschool class. Publicerad 2013 i *Early Child Development and Care, 184*(11), 1583–1598.

I denna studie undersöks vilka aktiviteter som uppstår när barn i en förskoleklass instrueras att skriva en berättelse med ordbehandlingsprogrammet *Liber Office* och två talsyntesprogram, *Talande tangentbordet* och *Vital*. Analysens fokus är riktad mot hur barnens situerade berättaraktiviteter medieras av lärarens introduktion, hennes deltagande och av den digitala teknologin. Det sociokulturella begreppet mediering (Wertsch, 2007) används för att förstå hur denna typ av aktivitet är beroende av det sociala, institutionella och materiella förutsättningarna. Tidigare studier har uppmärksammat barns användning av digital teknologi, individuellt eller i interaktion med andra, dock med lite hänsyn till lärarens roll (t.ex. Labbo & Reinking, 2003; Leeuwen & Gabriel, 2007; Van Scoter, 2008). Det finns dock några studier som involverar lärarens deltagande i analysenheten och resultaten visar att en engagerad och stödjande lärare är avgörande för barns möjligheter att närma sig teknologin och för att utveckla läs- och skrivkunnighet (t.ex. Klerfelt, 2007; Stephen & Plowman, 2008). Denna

studie bidrar till ökad förståelse för de institutionella villkoren för dessa processer.

Åtta barn deltog i studien genom att i par skriva en berättelse. Fyra av dessa, två pojkar och två flickor, videofilmades i par en gång vid separata tillfällen. Dessutom är lärarens två instruktioner inspelade. Det genererade materialet uppgår till ungefär en timme och transkriberades helt med inspiration från konversationsanalys, vilket resulterade i 644 tal-turer. Dessa analyserades enligt principerna för Interaktionsanalysen (Jordan & Henderson, 1995). Analysprocessen innebär att uppmärksamma vad deltagarna säger, gör och hur de svarar på varandras uttalanden och på den digitala tekniken. Dessutom analyserades sju digitalt skrivna berättelser.

Det som framgår av analysen är att lärarens introducerande av aktiviteterna har betydelse för barnens möjligheter att delta i uppgiften och reglera sina handlingar, ett resultat som får stöd genom slutsatser från andra studier (t.ex. Greiffenhagen, 2008; Luppinici, 2007). Introduktionens betydelse är särskilt synlig i det olika förhandlingsutrymmen som tilldelades barnen genom lärarens val av specifika ord. Vid första observationstillfället förstås två pojkars val av karaktär som en anpassning till lärarens yttrade önskan om en 'glad saga'. De väljer bort en föreslagen karaktär hämtad från populärkulturen för att istället, inspirerade av datormusen, använda en djurkaraktär i form av en mus. Vid andra tillfället introducerar läraren aktiviteten på ett mindre specificerat sätt och tilldelar därmed de två flickorna större förhandlingsutrymme. Ett annat resultat är att läraren framför allt ställde frågor rörande teknologin och skrivkonventionerna, snarare än om berättelserna. Skälet till denna typ av scaffolding kan vara skolans deltagande i det kommunala skrivprojektet som inom ramen för projektet huvudsakligen använder teknologi för att stödja skrivande. Analysen indikerar att barnen delvis drog nytta av talsyntesprogrammen, vilket är ett resultat som överensstämmer med vad som indikerats av forskning gjord på 1980-talet och 90-talet (Labbo & Reinking, 2003; Van Scoter, 2008). Synligt i analysen är dock barnens brist på operativa färdigheter, vilket orsakar svårigheter att hantera teknologin och som en konsekvens blir berättandet delvis underordnat. Dessutom upptas deras ansträngningar av att hantera arbetsfördelning och diskutera skrivkonventioner.

Studie II: Children's digital storymaking: The negotiated nature of instructional literacy events. Publicerad 2015 i *Nordic Journal of Digital Literacy*, *10*(3), 170–189.

Syftet med studie II är att empiriskt utröna sambandet mellan den interaktion som äger rum i teknologi-medierade literacy events och de producerade berättelserna. Vad som motiverar studien är att berättargenren ofta används som ett sätt att engagera barn i den tidiga läs- och skrivutvecklingen (Klerfelt, 2007). Förmågan att berätta är inte medfödd utan utvecklas genom deltagande i sociala praktiker där förskoleklassen utgör ett sådant viktigt sammanhang för lärande (Brice Heath, 1983/1996; Bruner, 1996). Med den nuvarande digitaliseringen erbjuds nya möjligheter till multimodalt berättande genom olika teckensystem som ord, symboler, bilder, ljud och färger. En betydelsefull fråga blir då hur berättaraktiviteter kan arrangeras i klassrummet. Studien guidas av frågor om hur teknologin, lärarens scaffolding och andra kontextuella resurser medierar barnens berättelser och vad som konstituerar de olika approximationerna av en narrativ genre som barnens produktioner exemplifierar. För att förtydliga, syftet är att empiriskt utröna relationen mellan den förhandling som sker under berättandet och de slutliga produkterna (dvs. berättelserna).

Den teoretiska utgångspunkten för studien är ett sociokulturellt perspektiv, vilket innebär att interaktionsaspekterna för meningsskapande och lärande är i förgrunden och att lärande är beroende användning av kulturella redskap där språket utgör det främsta (Vygotskij, 1987; Wertsch, 2003, 2007). Begreppet scaffolding (Wood et al., 1976) används vidare för att konceptualisera lärarens stöd i aktiviteterna.

Åtta förskoleklassbarn (sex år) och en lärare deltar i studien. Skolan är kommunal och ligger i utkanten av en mindre svensk stad i ett relativt välmående område. Programvaran, *Storybird*, som används erbjuder en skrivyta och tematiskt organiserade och illustrerade bilder som utgångspunkt för att berätta. Barnen har använt programmet någon enstaka gång före det att observationerna utfördes och inleder med att välja bilder såsom läraren har instruerat. Aktiviteterna utförs i par.

Det empiriska datamaterialet består av videoinspelningar av åtta aktiviteter gjorda vid tre tillfällen, vilket resulterar i ca fyra timmar och 30 minuter film. Sekvenser då barnen förhandlar om berättelsens innehåll vid varje vald bild och lärarens stöttning viss dessa tillfällen har transkriberats ordagrant och där även kroppsrörelser är inkluderade. Dessa sekvenser har därefter analyseras enligt Interaktionsanalysens principer med minst tre tal-turer inkluderade i analysen (Jordan & Henderson, 1995). Vid analys av de åtta berättelserna framkommer att de varierar i termer av vad som analytiskt refereras till som approximationer

av en berättargenre avseende relationen mellan bild och text, innehåll och sammanhängande struktur. Analysen är utförd med terminologi hämtad från Nikolajeva och Scott (2001) och Bruner (1996). De tre empiriskt härledda kategorierna är benämnda *sammanhängande berättelse*, *osammanhängande berättelse* och *fragmenterad berättelse*.

Huvudresultatet i studien är att programvarans bilder är motiverande (jfr Leinonen & Sintonen, 2014) och triggar barnens berättande men att deras omfattande narrativa förhandlingar inte återspeglas i slutprodukterna. Diskrepansen förstås för det första som en konsekvens av lärarens mediering av aktiviteterna; genom de frågor hon ställer riktas barnens uppmärksamhet mot en bild i taget snarare än att utgå från en övergripande handling, vilket i huvudsak resulterar i osammanhängande berättelser. Wells Rowe (2013) hävdar att sexåringar ofta har en narrativ kompetens och kan konstruera sammanhängande berättelser. Det visar barnen i viss utsträckning genom att knyta an till händelser som följer av deras tolkningar av bildmotiven. För det andra uppmärksammar läraren det faktum att barnen ännu inte behärskar skriftspråket till fullo genom att transformera deras muntliga berättande till skriven text på papper som en modell för barnen att kopiera på tangentbordet. Detta förfarande medför en reducering av barnens muntliga berättande och resulterar i begränsad skriven text, vilket leder till spänningar mellan deltagarna. Emellertid ska inte lärarens handlande ses som felaktigt utan hennes scaffolding avser att förenkla uppgiften då hon förutser barnens svårigheter att appropriera skriftspråkets konventioner. Dock vidareutvecklas inte berättandet, denna betydelsefulla form av kommunikation, vilket enligt Bruner (1996) är en förutsättning för lärande. Analysen av berättaraktiviteterna belyser vikten av lärarens deltagande, vilket blir avgörande för slutresultatet, oavsett de resurser som finns i programvaran (Gelmini-Hornsby m. fl., 2011).

Studie III: "I think it should be a little like exciting": A technology-mediated story-making activity in early childhood education. Publicerad 2016 i S. Garvis & N. Lemon (Red.), *Understanding digital technologies and young children: An international perspective* (pp. 74–91). London: Routledge.

Mot bakgrund av digitaliseringen i de tidiga skolformerna och de frågor den väcker om hur en pedagogisk praktik kan erbjuda meningsfulla teknologi-medierande literacy-aktiviteter (Burnett, 2010) som involverar problemlösning och möjligheter att dra nytta av tidigare erfarenheter för att utveckla en högre

form av tänkande (Yelland, 2011) presenterar studie III ett sådant exempel. Studien fokuserar särskilt på två sexåringar när de instrueras att tillsammans skapa en berättelse med programmet *Storybird*. Syftet med studien är att granska barnens turtagande för att kunna urskilja vilka strukturerande resurser (Lave, 1988) de använder sig av och som stöttar hur uppgiften genomförs. Strukturerande resurser kan omfatta både verktyg, förkunskaper, erfarenheter och förväntningar som tas i bruk i en viss aktivitet (Säljö, 2000).

Studien genomfördes i en förskoleklass på en skola som valdes på grund av sitt deltagande i det kommunala skrivprojektet *Learning to Read through Writing on the Computer*. Totalt i studien deltar 16 barn, för denna studie har dock två flickors berättande med Storybird valts ut för djupanalys då de representerar en återkommande bild av samtliga observationer med denna teknologi. Storybird är en internetbaserad applikation som erbjuder tematiskt organiserade illustrerade bilder som grund för att skapa en saga.

Videoobservationer genomfördes vid fem tillfällen under 2012 och 2013. Den speciellt utvalda aktiviteten, som varade i cirka 35 minuter, filmades med två kameror och hela filmsekvensen transkriberades ordagrant utifrån en transkriptionsnyckel inspirerad av konversationsanalys som inkluderar både barnens verbala som icke-verbala kommunikation, såsom gester och animerade röster. En iterativ analys genomfördes i enlighet med Interaktionsanalys (Jordan & Henderson, 1995). Fem längre excerpter valdes ut för att visa hur berättaraktiviteten strukturerades i sin helhet av barnen och vilka språkliga handlingar de använde i interaktionen.

Resultatet visar att barnen tar en rad strukturerande resurser i bruk som både underlättar och begränsar berättelseskapandet. Den övergripande strukturerande resursen utgörs av den formaliserade uppgiften, det vill säga, av lärarens instruktion och hennes val av mjukvaruprogramvara. De tematiskt organiserade bilderna som tillhandahålls av *Storybird* fungerar som ett gynnsamt medierande redskap för barnens resonemang och förhandling (jfr Sakr, Connelly & Wild, 2016). Den strikta delningen av bilder, som inte tillåter fria val över teman, blir dock strukturerande i en begränsande mening (t.ex. hundmotiv finns inte att tillgå i ett katt-tema). En blandning av en mycket kontextuell (eller deiktisk) språkanvändning, till synes framkallad av tvetydigheter i de digitala bilderna, och en mer dekontextualiserad semiotisk användning i form av resonerande bortom bildmotivet kan urskiljas i det empiriska materialet. Detta varierade språkbruk blir således strukturerande för förhandlingens fortskridande. Vidare blir barnens kunskaper om

äventyrsgenren en resurs, vilket visar sig i valet av bilder och skrivna formuleringar som stämmer överens med genrens karaktäristika. Tydligt i analysen är den föränderliga karaktären av de narrativa förhandlingarna, vilket verkar vara i analogi med barns lekmönster som definierats av Schwartzman (1978). Lek är en betydande resurs i utforskandet av språk och literacy (Saracho & Spodek, 2006) och i denna studie blev lekmönster även en strukturerande resurs.

Studie IV: 'Horrible or happy' – we'll have a little grey now': Aesthetic judgements in children's narration with an interactive whiteboard. Publicerad 2016 i *International Journal of Early Years Education*, 25(1), 72–88.

Studie IV undersöker vilka aktiviteter som uppstår när sexåringar instrueras att skapa en saga på en interaktiv skrivtavla. Forskningsintresset är tvåfaldigt: för det första att undersöka hur och i vilken utsträckning läraren och barnen lyckas rikta gemensam uppmärksamhet mot något när digital teknik är inblandad; för det andra att undersöka vilken roll de frekvent yttrade estetiska värdeomdömena har i aktiviteterna.

I förskoleklassen arrangeras ofta målstyrda aktiviteter på gruppnivå. En förutsättning för att utföra en sådan aktivitet är att deltagarna lyckas skapa en gemensam förståelse av syftet. Behovet av att uppnå tillräcklig intersubjektivitet (Rommetveit, 1974) gäller både mellan barnen och mellan barnen och läraren, vilket enligt tidigare forskning kan vara en komplicerad kamp (Bendroth Karlsson, 2011; Lagerlöf, Wallerstedt & Pramling, 2014). En utgångspunkt för studien är att barns berättande är en kreativ, multimodal och estetisk aktivitet (jfr Faulkner & Coates 2011). För att förstå barns kreativitet i en digital miljö används Vygotskijs (2004) definition av begreppet som beskriver hur barn skapar nya saker från tidigare erfarenheter. I tillägg används Deweys (1934/1980) filosofiska idéer kring estetisk erfarenhet med ett fokus på värdeomdömen, vilket innebär bedömning av det kreativa arbetet efter uppskattning och smak. Analysen konceptualiserar lärarens stöd som scaffolding (Wood et al., 1976).

En erfaren förskollärare och fyra barn på sex år deltog i studien som utfördes i en teknologi-tät grundskola. En interaktiv skrivtavla som har en beröringskänslig skärm användes. Teknologin kompletterades med standardprogramvaran *Notebook* som erbjuder ett verktygsfält bestående av ikoner som innehåller pennor, ett radergummiverktyg och en färgpalett. På

grund av designen förberedde läraren aktiviteterna genom att dela in skärmen i fyra tomma lådor, numrerade 1–4, för att begränsa utrymmet.

Sex berättaraktiviteter spelades in med två videokameror med ett par barn i taget (vid det första tillfället tre barn) i ett intilliggande klassrum. Datamaterialet innehåller film som uppgår till ungefär fyra timmar och 30 minuter. Materialet transkriberades i sin helhet, inklusive deltagarnas tal, gester och tecken på skärmen. Vid analys av materialet enligt principerna för Interaktionsanalys (Jordan & Henderson, 1995) har fokus varit på interaktionen och deltagarnas verbala uttalanden genom vilka estetiska omdömen kan urskiljas. Även fältnoteringar ingår i datamaterialet. Exempel från transkriptionen ges vid de tillfällen då deltagarna tycktes anstränga sig för att uppnå tillräcklig intersubjektivitet. Dessutom gjordes ett urval av exempel på grundval av deras tydliga illustration av de artikulerade estetiska bedömningarna.

Ett av de två huvudresultaten visar att teknologins design och meningserbjudanden i form av en färgpalett och ett radergummiverktyg framkallade det kreativa visuella skapandet på skärmen. Som ett resultat utvecklades en spänning mellan lärarens försök att stötta barnen i att muntligt berätta utifrån sina bilder och barnens vilja att undersöka teknologins funktioner. Sålunda ledde barnens fokus på färgpaletten och uppenbar motvilja att muntligen berätta ibland till otillräcklig intersubjektivitet mellan dem och läraren (jfr Rommetveit, 1974). Vad läraren begärde var i själva verket en krävande uppgift. Att kondensera och transformera en berättelse som är skapad metaforiskt och förkroppsligad i det materiella till ett muntligt uttryck blir en blek jämförelse, hävdar Wright (2011). Barn-dyaderna upprättade dock tillfälligt tillräcklig intersubjektivitet för att fortsätta med sitt visuella projekt. Analytiskt kan det förstås härröra från deras gemensamma kulturella erfarenheter av populära media.

Resultatet visar även att deltagarna frekvent använde sig av estetiska uttryck i form av värdeomdömen på handlingar och på de visuella objekten på skärmen. De estetiska värdeomdömena spelar en viktig roll i strukturerandet av aktivitetens fortskridande mot sin fullbordan. I linje med Jakobson och Wickmans (2008) studier visas att de uttryckta estetiska värdeomdömena är särskilda indikatorer på vad barn lär sig i en aktivitet när det gäller att identifiera vad som är och inte är relevant för att gå vidare med uppgiften. I studien blir det synligt exempelvis när barnen laborerar med nyanser på bakgrundsfärgen i förhållande till deras målade objekt som utgör förgrund.

Diskussion

I avhandlingens fyra empiriska delstudier har det övergripande syftet varit att undersöka vilka aktiviteter som uppstår när sexåringar instrueras att berätta med digital teknologi i förskoleklassens literacy-praktik utifrån olika infallsvinklar. En syntes av studiernas resultat indikerar att flera integrerade frågor står på spel i de analyserade literacy-händelserna och att de delvis bör förstås och diskuteras mot bakgrund av skolornas deltagande i ett kommunalt projekt, *Att skriva sig till läsning med datorn*. Detta har bidragit till att diskussionen disponerats i enlighet med två övergripande frågeställningar: *på vilka sätt medierar den digitala teknologin, andra kulturella redskap och lärarnas stöttning barnens berättaraktiviteter*, och *vilka pedagogiska utmaningar uppstår i teknologi-medierade aktiviteter inom ramen för förskoleklassens kontext*?

Framträdande är att barnens skapande av berättelserna i stor utsträckning medieras av lärarnas organisering av aktiviteterna i form av en samarbetsuppgift, deras introduktioner, på det sätt de scaffoldar (stöttar) och de utvalda digitala teknologiernas design. Utifrån det sociokulturella perspektiv som utgör teoretisk grund för studierna är undervisningens mål bland annat att introducera barn för kulturella redskap, i form av begrepp och fysiska artefakter (Wertsch, 2007). I studierna exemplifieras detta främst av begreppet *saga* och de olika digitala teknologierna med vilka läraren grundar för den nödvändiga etableringen av intersubjektivitet mellan deltagarna för att kunna förstå och utföra den givna uppgiften. Tidigare empiriska studier gjorda i förskolan visar att koordinering av perspektiv är komplex (t.ex. Kultti & Pramling, 2015; Lagerlöf m.fl., 2014) och tycks delvis bero på otillräcklig instruktion eller bristfälligt tillhandahållande av redskap (Bendroth Karlsson, 2011). I analyserna av de observerade aktiviteterna förefaller introduktionerna tillräckliga; trots det blir de föremål för förhandling (t.ex. i Studie I), vilket enligt Greiffenhagen (2008) är ett arbete elever gör för att förtydliga en uppgifts syfte. Stundtals uppstår även svårigheter att etablera tillräcklig intersubjektivitet, främst mellan barnen och läraren, vilket resulterar i olika projekt. Det vill säga, å ena sidan förefaller berättandet och ett kreativt utforskande av de semiotiska redskap som teknologin erbjuder vara i fokus för barnen. Exempelvis medierar Storybirds bilder muntlig berättande medan Notebooks färgpalett medierar det som främst blir ett visuellt och estetiskt projekt för barnen snarare än ett muntligt berättande. Lärarna, å andra sidan, är främst orienterade mot, i det ena fallet skrivkonventioner, vilket förstås vara i linje med det kommunala projektet

(Studie I-III) och i det andra fallet mot att utveckla narrativ kompetens (Studie IV). Anledningen till den tidvis bristande intersubjektiviteten står tillsynes att finna i det sätt lärarna väljer att stötta barnen men även i teknologins design. Det här resulterar även i att barnens slutliga berättelser övervägande blir osammanhängande (Studie II).

Studiernas resultat är ännu ett exempel på vad som nu är väl dokumenterat av forskare som Dyson (2001, 2003, 2010), Fast (2007), Marsh (2010), Roswell och Harwood (2015), Urbach och Eckhoff (2012), att det som främst bidrar till barnens upprättande av tillräcklig intersubjektivitet sinsemellan är deras gemensamma erfarenhet av populärkulturella texter. Den ömsesidigt delade erfarenheten konstituerar ett slags förgivettagande och en samklang där vissa lånade symboler och narrativa element inte behöver förhandlas om. Emellertid är intersubjektivitet på grund av sin fluktuerande natur svår att upprätthålla under en längre period och vad som framgår i datamaterialet används en kombination av kommunikativa muntliga och gestikulära uttryckssätt för att nå tillfälligt tillräcklig gemensam förståelse (jfr Rommetveit, 1974; Klerfelt, 2007; Kultti & Pramling, 2015).

Forskning gällande barns kreativa berättelseskapande är att de tar en mängd varierade semiotiska uttryckssätt i bruk såsom tal, gester, skrift, bilder, symboler, färger och ljud (t.ex. Coates & Coates, 2006; Faulkner & Coates, 2011; Mills, 2011; Theobald, 2016; Wright, 2011; Änggård, 2005). I en teknologi-medierad berättaraktivitet hävdar Letnes (2014) att det finns fler möjligheter att kombinera dessa kommunikativa uttryckssätt, vilket kan fördjupa barns förståelse för semiotikens möjligheter till meningsskapande. I föreliggande studier ses den valda teknologin mediera olika språkliga handlingar genom bilder eller ritverktyg som i studierna kan ses variera allt från ett begränsat och kontextuellt språkbruk till en mer vidgad, känslomässig och estetisk användning (Studie II-IV). Märkbart är emellertid de uppenbara svårigheterna som uppstår i transformationen från till exempel det muntliga till det skriftliga och från det visuella till det muntliga. Orsaken till svårigheterna kan inte enbart förstås utifrån teknologin utan återfinns i relationen mellan vad den möjliggör, de semiotiska uttryckssättens lagar såväl som lärarens pedagogiska mål. Studiernas resultat pekar även på att hanteringen av både teknologin och skriftspråkssystemet bjuder barnen motstånd, vilket bidrar till att berättandet stundtals blir underordnat.

I digitaliseringens spår finns det tydliga tecken på en literacy-praktik i förändring, argumenterar både Hultin och Westman (2013) och Sofkova

Hashemi och Cederlund (2016), genom att både den traditionella phonics traditionen, som positionerar teknologin som en leverantör av literacy, och whole language traditionen, där teknologin är ett medium för socialt meningsskapande, existerar parallellt. De observerade literacy-händelserna i de två förskoleklasserna kan inrymmas i båda traditionerna genom att; å ena sidan, använda speciellt utvalda teknologier som stöder tekniska läs- och skrivfärdigheter (jfr Liberg, 2007) i enlighet med skolornas medverkan i kommunprojektet och å andra sidan, i tillägg använda teknologi som genom sina egenskaper utökar möjligheterna till kollaborativt, kreativt och estetiskt berättande. Konfigureringen av förskoleklassens literacy-praktik för med sig pedagogiska utmaningar i form av att kunna skapa en röd tråd som löper mellan ett planerat lärandemål, introduktion av lämpliga begrepp och teknologier som motiverar och stöttar lärandet av det specifika innehållet. På ett sätt konstituerar valet av den digitala teknologin tillsammans med utformningen av en uppgift kontexten och ger barnen en viss stöttning, men i linje med Sefton-Green m.fl. (2016) och med grund i de empiriska studierna, argumenterar jag för att en lärares direkta och sensitiva scaffolding under exempelvis berättelseskapande är avgörande för hur en literacy-händelse utvecklas.

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