Teacher professional learning in response to contemporary challenges in early childhood education and care

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Abstract

The purpose of this doctoral thesis is to generate new knowledge, through the empirical study, of how an Early Childhood Education and Care (ECEC) work team collectively learn about two contemporary challenges in ECEC, by means of a theoretical framework. More specifically, how they learn about the relationship between teaching and play, particularly in relation to children's digital experiences in play. The thesis is based on a combined research and development project where a work team in preschool were introduced to the theoretical framework Play-responsive early childhood education and care (PRECEC) which has implications for how to understand teaching and play activities in preschool. A sociocultural perspective functions as the theoretical framework of the thesis and the data consists of ten audio and Zoom-recorded focus group conversations which have been analyzed through Sociocultural Discourse Analysis. The thesis contains three empirical studies where the findings show how reading research articles and watching video-recordings play a central part when the participants appropriate theoretical concepts. The findings also show how time and dialogue based on scientific knowledge matters for the learning process when the work team change their reasoning about the teacher's role in play. In addition, the findings illustrate how PRECEC, for the participants, mediate an understanding of play and teaching as responsive activities requiring mutual (digital) experiences. This mediating process is discussed as potentially enabling teacher agency. Overall, the findings contribute with new knowledge regarding how an ECEC work team learn about contemporary challenges by means of PRECEC and are therefore discussed in

relation to implications for what becomes important when organizing for professional development in ECEC settings.

Acknowledgements

When I started out my PhD training, I had the naïve idea that writing a thesis was something I could do on my own. I quickly understood that this was not the case and I have many people to pay gratitude to. I am truly grateful to the work team participating in the project and I especially applaud their bravery to, although hesitant, be willing to try to use digital technologies in their practice. I am so glad to have been guided by my eminent supervisors Cecilia Wallerstedt and Pernilla Lagerlöf from whom I have learned tremendously during all stages of finalizing my thesis. You have supported me in many ways but mainly by always making me feel like a competent student on her way to becoming a researcher. There are two people who made it possible for me to become a PhD student, Eva Sunegård and Ludwig Wixtröm, thank you for believing in me. Many people have at different times taken their time to read my work. These include Karin Lager, Ingrid Engdahl and Joce Nuttall who gave me valuable and constructive comments on the planning seminar, mid seminar, and final seminar for which I am truly thankful. Thank you to all senior researchers and fellow PhD students participating in text seminars within the research environment PrePLanT for providing me with comments on my texts and with the opportunity to learn how to think scientifically. A special thank you to Niklas Pramling who organizes these seminars and who has willingly taken his time to read and comment on large parts of my text. I am grateful to Desirée Engvall for providing support with all administrative issues surrounding a PhD training. Also, I have had the luxury to be part of not one but two research schools. I would like to give an equally big thank you to all members of ReCEC and PRECEC_SCS research school for supporting me with your commitment and competence, especially to all the PhD students, Tove, Olga, Jenny. Petra, Monica, and Sara in ReCEC and Hiba, Madeleine, Sofije, Anna, Kristina, Kristine, Lena and Maria in PRECEC_SCS. A special thank you to fellow PhD students and friends, Lea and Petra. Without you, my time as a PhD student would have been less fun and more difficult. I also want to give a special thank you to my Australian team, fellow PhD students Honor, Jane and Alex and Professor Susan Edwards, for your support and friendly feedback on my project.

Contents

Part One

Chapter 1 Introduction

This thesis will address teacher professional learning in relation to contemporary challenges in Early Childhood Education and Care (ECEC)[1]. In line with attempting to ensure quality in the ECEC sector, an increased interest has been directed towards the professional development of early childhood (EC) teachers, as they are arguably of major importance for raising quality in preschools (OECD, 2020; Waters & Payler, 2015). Moreover, the ECEC sector is constantly undergoing change, especially due to policy changes, which put demands on how EC teachers are expected to carry out their work. It therefore becomes important to arrange for useful professional development efforts for these teachers. In addition, in Sweden, recent changes in the national curriculum for preschool (Curriculum for the preschool [Lpfö18], 2018) include adding the concept of 'teaching' in addition to focusing on developing children's digital skills. These changes have resulted in challenges concerned with understanding the relationship between teaching and play as well as how to understand children's digital experiences in play. It therefore becomes relevant to investigate teacher professional learning in relation to these challenges. Teacher professional learning will in this thesis be empirically investigated through a practice-oriented research approach including Focus Group Conversations (FGCs) with video stimulated recall with an ECEC work team for a period of 16 months. A premise for this thesis is that meaning making takes place between people and through language (in a wide sense, encompassing also non-verbal semiotic means) and the FGCs will therefore be focus for analyzing how the work team collectively learn in relation to contemporary challenges.

Moreover, this thesis is written within the research school Swedish National Research School on Play-Responsive Early Childhood Education and Care for Social and Cultural Sustainability (PRECEC_SCS), funded by the Swedish Research Council (grant no. 2019-03786). The research school encompasses three

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[1] In much of the international literature, the term Early Childhood Education is used when discussing education provided to young children. In Sweden, the concept of 'care' has been and is closely linked to education in preschool and the term Early Childhood Education and Care is therefore used throughout this thesis (except for Article I as the notion of 'care' was brought to my attention after the article was published). In addition, in Sweden, ECEC is most commonly referred to as preschool which is why 'preschool' appears in the text in addition to ECEC.

contemporary challenges in preschool, which in short are (i) the possibly marginalized role of play in preschool due to focus on teaching and education, (ii) that digitalization means that children have many and different experiences when they start preschool and (iii) that many children who attend preschool do not speak the majority language and therefore does not have the same prerequisites to participate, learn and develop. This thesis relates to the two first challenges. In addition, the research school is informed by the theoretical framework PRECEC (Pramling et. al., 2019) which includes useful concepts for analyzing and understanding play and teaching in ECEC (see below for further explanation). Note that PRECEC_SCS is the name of the research school and PRECEC refers to the theoretical framework. Also, in this thesis, PRECEC is not used as a theoretical framework for analyzing data, instead, focus is on how an ECEC work team learn about teaching, play and children's digital experiences in preschool by means of this framework.

Background

As part of ensuring quality in ECEC, a gained interest has been directed towards the professional development of EC teachers[2], both from international organizations (OECD, 2020) and within the research community (e.g., Cherrington & Thornton, 2015; Peleman et al., 2018). While there is consensus regarding the importance of providing professional development opportunities for EC teachers, little is known about the processes by which teachers learn (Peleman et al., 2018; Sheridan et al., 2009). Moreover, in Sweden, teacher professional learning is made visible in the Swedish Education Act (SFS 2010:800), stating that education should always be founded on a scientific basis and proven experience. This means that a part of EC teachers' profession is to reflect continuously on their way of working as well as on their view of children and knowledge. This requires the need to learn about scientific methods that provide tools for analyzing and handling challenges that occur in preschool practice (Swedish School Inspectorate, 2018).

A contemporary challenge faced by EC teachers, worldwide, is to understand and handle the potential tensions between teaching and play (Bubikova-Moan et

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[2]   In Swedish preschool, there are different categories of personnel such as preschool teachers, childminders and uneducated staff. The work team participating in this study consists of different categories of personnel and throughout this text, they will therefore be referred to as early childhood teachers.

al., 2019; Edwards, 2017), mainly due to recent focus on academic learning at the expense of play (Fleer & van Oers, 2018). In Sweden, this challenge gained attention when the concept of 'teaching' was added to the national curriculum for preschool in 2018 (Lpfö18, 2018). While the curriculum highlights play (and in the new version, the importance for teachers to participate in children's play), as an important dimension of preschool practice, it also now includes guidelines relating to teaching. This leads to the challenge of teaching a learning content while at the same time promoting play, a challenge proven difficult for EC teachers to handle, especially since many EC teachers equates teaching with learning (Swedish School Inspectorate, 2018). The conceptual framework of Play-Responsive Early Childhood Education and Care (PRECEC) relates to this challenge in the sense that it theorizes how to create opportunities for teaching within and in response to play without turning play into non-play[3] (Pramling et al., 2019; Pramling & Wallerstedt, 2019). Since PRECEC provides resources for taking on the challenge of understanding the relationship between teaching and play, the work team participating in the project reported in this thesis has been introduced to this theory. One central idea within PRECEC is that play is understood as something that participants signal to each other through fluctuations between *as if* and *as is* and teaching is understood as an activity in which both children and teachers are mutually engaged (this distinction and concept are further developed below, in previous research on the relationship between play, teaching and learning). This indicates that the teacher needs to be responsive towards children's intentions in play.

With this focus on play, another challenge within ECEC becomes evident, that is, for EC teachers to understand contemporary play, in particular the role that digital media[4] have in children's play today (Stephen & Edwards, 2018). While much research illustrate how digital media are a central part of children's contemporary play (e.g., Caughey et al., 2023; Ågren, 2015), a great deal of research also indicate that EC teachers find it challenging to integrate digital media in

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3   See chapters on Previous Research and Method and Methodology for further description. Moreover, in Swedish research literature, PRECEC is referred to as "Lekresponsiv undervisning" (LRU) ,which translates to Play-Responsive Teaching in English. Hence, there is some mismatch between the terms in the two languages, with the English version better capturing the scope of this theorization.

4   In the research literature, digital media is one out of many conceptualizations used when discussing children's digital experiences. Others include for example digital technologies or ICT. In this thesis, digital media is understood as including both the use of digital artifacts (e.g., tablet computers) and the content of popular culture (e.g., TV programs and/or YouTube).

ECEC, especially in relation to play (e.g., Schriever et al., 2020). This challenge became evident in Sweden due to the implementation of the new curriculum for preschool (Lpfö18, 2018) as it now includes a focus on digital media as a mandatory content as well as a pedagogical tool. While not relating digital media to play, the curriculum states that education in preschool should provide children with opportunities to develop adequate digital skills (Lpfö18, 2018). What adequate skills are, is deliberately not defined in the curriculum as it is argued that what constitute digital skills will change over time along with technical development, which means that teachers need to discuss this issue in order to concretize how to work with developing children's digital skills (Swedish National Agency for Education, 2023).

Important to note is that, as play has been proven difficult to define (Sutton-Smith, 1997), a definition in this thesis is not provided. Instead, play is understood from the participants' perspective, that is, what they for each other indicate that they take as play. This is also in accordance with how play has been approached when developing PRECEC. In a similar vein, it is not always clear, in previous research, what digital media include as these can range from working digital artifacts (e.g., computer tablet), non-working or imaginative artifacts (e.g., broken smartphone used in play or when an object is used to represent digital media) as well as popular culture (e.g., from Youtube or TV). In this thesis, digital media is therefore understood from the perspective of the participants, that is, how the participants reason about and define what digital media is.

In sum, while research exists indicating that EC teachers find it challenging to understand how to implement teaching in the play-based context of preschool education and how to understand children's digital experiences, especially in play activities, there is a lack of research in terms of how and what EC teachers learn in relation to these contemporary challenges. Given this background, this thesis aims to develop knowledge regarding how an ECEC work team collectively learn in relation to two pressing contemporary challenges of ECEC, by means of PRECEC. The findings will hopefully contribute to the research field of teacher professional learning as well as contribute with knowledge for anyone who is interested in organizing for professional development efforts in ECEC. In addition, the findings will hopefully contribute with knowledge for EC teachers, or others interested in PRECEC, in terms of what becomes important when organizing for children's education in relation to teaching, play and children's digital experiences.

Guidance for readers

This thesis contains two parts. The first part consists of a thesis frame, including an introduction providing a background for the thesis and an elaboration and clarification of the aim and research questions of the thesis. Thereafter, a literature review is presented in the form of previous research to give grounds for the relevance of the thesis. A sociocultural perspective is then introduced to be used as a theoretical framework for analyzing learning. Thereafter a motivation for the method and methodology of the thesis is presented; a practice-oriented research approach containing audio and Zoom-recorded focus group conversations based on research literature and video stimulated recall. This chapter also provides a presentation of sociocultural discourse analysis as an analytical tool as well as ethical considerations and limitations of the thesis. This is followed by a presentation of the findings through a summary of the three articles. In the final chapter, a discussion of the findings is presented. The second part of the thesis consists of the three articles:

I.   Stavholm, E, Lagerlöf, P, & Wallerstedt, C. (2021). Appropriating the concept of metacommunication: An empirical study of the professional learning of an early childhood education work-team. *Teaching and Teacher Education, 102*, 103306

II.   Stavholm, E., Lagerlöf, P., & Wallerstedt, C. (2022). Re-mediation in Early Childhood Teachers' Reasoning about their Role in Play: An Empirical Study of the Learning Process of a Work Team. *Early Years.* (Online first).

III. Stavholm, E., Lagerlöf, P., & Wallerstedt, C. (2023). The mediating role of concepts for collective reasoning about integrating play, teaching and digital media in preschool: A potential for enabled agency for early childhood teachers. *Journal of Early Childhood Research, 21*(4).

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Aim and Research Questions

The overarching aim of this thesis is to generate new knowledge, through the empirical study, of how an early childhood education and care work team collectively learn about contemporary challenges in early childhood education and care, by means of PRECEC. More specifically, how they learn about the relationship between teaching and play and how to understand children's digital experiences in play, when introduced to PRECEC in a combined research and development project. This interest is approached by asking the following research questions in three articles:

Article I:

- In what ways do cultural resources introduced into focus group conversations (i.e., articles, notes, and video-recordings) mediate early childhood teachers' understanding of the concept of metacommunication, in talk?
- How does one work-team of early childhood teachers appropriate the concept of metacommunication?

Article II:

- How do members of an ECEC work team collaboratively change their way of reasoning regarding their role in play when introduced to a theoretical framework with principles and implications for understanding this issue?

Article III:

- How does the theoretical framework PRECEC mediate an ECEC work team's reasoning about play and teaching in conjunction with digital media in preschool?

Chapter 2 Previous Research

This chapter presents previous research to ground the relevance of the thesis. The overview contains research located from search engines such as ERIC and Google Scholar in addition to articles and literature obtained through doctoral courses and university based seminars. The English search words used include teacher professional learning and development, early childhood education, preschool, play, learning, teaching, contemporary play, digital play, digital technologies, digital media, ICT, early childhood teachers' beliefs/attitudes/views. The same search words were used in Swedish, however words such as 'förskola' and 'förskollärare' were used instead of early childhood education and early childhood teachers. These search words were used in different combinations in an attempt to not elude possibly important findings. The search was at first limited to include studies only after the year of 2010, since the term teaching was added to the Swedish Education Act in 2010. However, in order to include important findings regarding play and learning related to, for example the role of the teacher in play, studies before 2010 was added. Moreover, the so called *snowball effect* was used, meaning that articles and other research literature were found through reference lists of articles found through the above mentioned search words.

Although this thesis concerns teacher professional learning in Early Childhood Education and Care (ECEC), the chapter starts with presenting research literature related to the field of teacher professional learning in school. This is since, although research concerning teacher professional learning in ECEC is growing, there are still few empirical studies investigating this topic. The second part of this chapter will present teacher professional learning specifically related to ECEC[5]. Thereafter, previous research related to what the work team in this thesis project learned about is presented. More specifically, research related to contemporary challenges in the form of the relationship between teaching and play as well as research related to children's digital experiences in play.

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[5]   In this thesis the term Early Childhood Education and Care (ECEC) is used, however, when studies present other terms, such as Early Childhood Education (ECE), these will be used in relation to the reported study.

Teacher Professional Learning

Even though a large body of literature exists within the area of teacher professional development and learning, the field is fragmented (Kennedy, 2014). This fragmentation can be seen in the many conceptualizations of teacher learning, such as, professional development and continuous or continuing[6] professional development as well as professional learning. The different conceptualizations are many times used synonymously. However, Webster-Wright (2009) argues that it is important to differentiate between professional development and professional learning. In an extensive review of the professional development literature across professions, she argues that professional development relates to a program, training, or education with the purpose of developing the teacher, indicating that the teacher is a passive recipient of new knowledge. Professional learning on the other hand, concerns learning processes in which teachers are regarded as active participants. The discursive shift from development to learning is also discussed by O'Brien and Jones (2014) who argue that the term professional learning is concerned with a less performative and more critically reflective approach in comparison with the career progression associated with professional development. In relation to the above mentioned discussion on terminology and the focus of this thesis, that is, to explore how teachers collectively learn about contemporary challenges in ECEC by means of PRECEC, I will use the term teacher professional learning (except when the cited literature uses another term).

In relation to the fragmented state of the research literature within professional development, Kennedy (2014) has made an attempt to describe what kind of studies exists within the field. She divides this research into five types: context-specific initiatives, particular models of continuing professional development (CPD), characteristics of effective CPD, impact of CPD and CPD policy studies. When it comes to literature on specific models of CPD, she argues that much of this literature has explored particular models resulting in merely typologies of CPD models, whereas little attention has been paid to synthesizing these models in relation to policy, power and professionalism. She also argues that the individual teacher's learning has been focus for much research and therefore more knowledge is needed related to how teachers learn together where the unit of analysis is the collective. The kind of synthesis she is promoting, is visible in her seminal work

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[6]   For a discussion on the use of continuous or continuing professional development, see O'Brien and Jones (2014).

from 2005[7] (Kennedy, 2005), where she identifies nine key professional development models and then classifies these in terms of how they are able to support professional autonomy and transformative practice. While Kennedy (2005, 2014) has focused on the purposes and outcomes of professional development in her classification, Boylan et al. (2018), have focused on general professional learning models when developing and illustrating an analytical framework by analyzing and critiquing five significant contemporary theoretical models of learning processes within the field of teacher professional learning. These models are proposed by Guskey (2002), Desimone (2009) (singular pathway models), Clarke and Hollingsworth (2002) (a multiple pathway model), Opfer and Pedder (2011) (a systems model) and Evans (2014) (a cognitive learning model). By comparing the models against an analytical framework focusing on model components, scope, theories of learning, agency and philosophical assumptions, the authors identify differences, similarities, inconsistencies, and limitations in the models. In relation to their findings, they claim that the complexities of professional learning cannot be understood using a single model. Instead, they propose to reconsider the models as tools to be used alongside other constructs. The models proposed by Clarke and Hollingsworth (2002) and Opfer and Pedder (2011) received some critique from Boylan et al. (2018) in terms of not providing sufficient understandings of professional learning. However, in relation to the two models, the authors put forth important arguments regarding how professional learning cannot be understood in terms of knowledge being transferred from a person to another. Instead, professional learning should be understood in relation to environments of change in the form of domains (Clarke & Hollingsworth, 2002) or subsystems (Opfer & Pedder, 2011). In addition, in Sweden and the other Nordic countries, a model proposed by Lauvås and Handal (2015) has been influential in terms of understanding how professionals develop knowledge (not limited to the field of education). In their idea of a practice professional theory [Swe:*praktisk yrkesteori*], focus is directed towards the relationship between thinking and action and how professionals develop through acting and reflecting on these actions based on the idea of what a good practice is.

Moreover, one of the types of studies described in Kennedy's (2014) research overview, concerns what effective professional development is. Some researchers argue that there is a consensus regarding what constitutes high-quality professional

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[7] Kennedy presents an updated version of this framework in Kennedy (2014) where she found that research on teacher professional development had increased a great deal since the first overview was conducted.

development. For example, Desimone (2009) claims that there are at least five features of effective professional development. These are content focus, active learning, coherence, duration, and collective participation (Desimone, 2009, p. 183). In a similar vein, Darling-Hammond and Richardson (2009) found in their research overview that effective professional development in education is characterized by content-rich, intensive and sustained, job-embedded and collaborative learning strategies. They continue to describe a paradigm shift within the field of teacher professional learning consisting of a move from ineffective 'drive-by' workshops to the idea of professional learning communities (PLC). While there is no universal definition of a PLC, Stoll et al. (2006) argue that there is "international consensus that it suggests a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way operating as a collective enterprise" (Stoll et al., 2006, p. 223). In their extensive literature review on the topic of PLC, Stoll et al. (2006) continue to argue that the main idea of a PLC is the notion of community. In other words, that focus is on collective learning where the salient point concerns professional learning within a community context in contrast to the individual teachers' professional learning.

While research findings have described and shown the effectiveness of PLCs, they often do not reveal how this effect is brought about (Webster-Wright, 2009). As Webster-Wright (2009) argues, the current state of research into professional development and learning has contributed enormously to what we know about teacher professional learning, however, this research needs to be complemented with research focusing on the processes by which teachers learn (see also Opfer & Pedder, 2011). Although a few studies on the process of teacher learning exist (e.g., Johannesson, 2022), Vermunt et al. (2019) argue that there is still a need to shift focus from how to best implement professional development programs to investigating how teachers learn, and especially how teachers learn collectively. The current thesis will attempt to contribute to knowledge regarding this topic by exploring how an ECEC work team collectively learn in relation to contemporary challenges in ECEC, by means of PRECEC.

In this section, I have presented a brief overview of the state of research related to teacher professional learning. Since the current study takes place in a preschool[8],

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[8]   In Sweden, government provides early childhood education and care through preschool to children aged one to five. The Swedish preschool is an optional service that offers a national curriculum based education.

the next section will elaborate on previous research concerning teacher professional learning in ECEC.

Teacher Professional Learning in Early Childhood Education and Care

While the research reviewed in the previous section is of relevance for providing a background to the current thesis, and although there are aspects of early childhood teaching that are similar to teaching in school, ECEC differs from education in school, and it is therefore not possible to rely only on research from school education regarding teacher professional learning (Cherrington & Loveridge, 2014). Such differences include that team teaching is the norm in ECEC and work teams normally consist of personnel with different educational backgrounds and teaching qualifications. In addition, EC teachers work closely with parents and due to the young age of the children, the teachers are responsible for both education and care of these children. Despite these differences, the debate concerning terminology related to professional learning are similar (albeit fewer) to the ones in the field of education in school, in terms of a discursive shift from 'professional development' to 'professional learning' (Edwards & Nuttall, 2009).

When it comes to the current state of research on teacher professional learning in ECEC, the field is growing and similarly to professional development related to school education, much research has focused on the effectiveness and outcomes of different forms of professional development programs (Sheridan et al., 2009). Examples of these kind of studies can be found in a European systematic literature review by Peleman et al. (2018). The authors found that professional development programs in ECEC that were long-term and integrated into practice as well as based on the active engagement of the practitioners, sharing the same theoretical framework, were the most effective in terms of promoting quality pedagogical practices. In Sweden, examples of ECEC research concerning outcomes of professional development programs can be found in empirical studies such as Asplund Carlsson et al. (2008) and Gustavsson and Thulin (2017) where for example Gustavsson & Thulin (2017) investigated EC teachers' understanding of science as a content in relation to teaching, before and after participating in in-service training. In addition, a recent study by Hellberg (2019) explores what comes about during a work team's planning of an intended object of learning connected to science in preschool. The author concludes that a long-term time perspective is pivotal in relation to how the work team developed the language

related to a science content as well as in terms of where the work team sees opportunities to turn physics into learning objects. This is in line with the findings of Peleman et al. (2018) concerning the long-term aspect as a characteristic of effective professional development in ECEC.

Moreover, as mentioned previously, PLCs have emerged as a way of understanding and supporting professional learning in school education, however, within the field of ECEC, empirical research regarding the use and development of PLCs is rare (Cherrington & Thornton, 2015). Since some aspects of ECEC differs from that of school education, Cherrington and Thornton (2015) aimed to investigate how these unique characteristics of ECEC influenced the development and activities of PLCs in early childhood settings in New Zealand. The authors found that, what constitutes effective PLC in school education is also applicable within ECEC; however, supportive structural and relational conditions need to be developed in order to reach the same kind of quality provided by PLCs in the schooling sector. Such conditions include handling frequent staff changes in addition to allowing for time to reflect together which is not easily achieved due to that ECEC services usually offers full-day programs.

Taken together, the reviewed studies have provided important findings in terms of what constitutes effective professional development in ECEC. However, Sheridan et al. (2009) argue that there is a relatively small body of empirical research that is concerned with the learning processes of EC teachers. Peleman et al. (2018) write that this is still the case and therefore argue that there is a need for research that does not only investigate the form and structure of professional development in ECE, but also its processes. An example of such a study was conducted by Edwards (2007), where she investigated how a group of EC teachers appropriated sociocultural theory when participating in a research and development project. 13 teachers and one assistant participated in the study by attending nine workshops which were audio-recorded and transcribed. These recordings, together with reflection journals and questionnaires functioned as data, which was analyzed with the help of activity theory. The findings reveal that the process of appropriating a new theoretical framework involved critiquing and analyzing existing practices. This meant that the teachers compared their existing understandings of curriculum, which were informed by a developmental-constructivist framework, with arguments deriving from sociocultural theory. This process peaked when the teachers tried new ways of working which were influenced by their new theoretical understanding.

Another example of a study concerned with how EC teachers learn, is Wood and Bennett (2000). As part of a research-based enquiry project, they investigated how nine EC teachers changed their theories of play and their relationship to practice. Through a multi-method approach that included stimulated recall, the teachers' theories of play and their relationship to practice were analyzed. The findings show how their theories and/or play practices changed in a three stage process, where watching and discussing video-recordings of play activities played an important role. While the two above mentioned studies include aspects of how teachers learn together (for example, parts of the data included audio-recordings of discussion groups), they do not have a specific focus on collective learning processes.

In addition, specifically related to the Swedish context and the newly inclusion of the concept of teaching in the national curriculum (Lpfö18, 2018), Bergmark and Westman (2022) have investigated preschool teachers' professional learning in an action research project. In this project, the teachers' tried to use new conversations methods with the children and the findings illustrate how the teachers examined and negotiated these methods to make them more aligned with their view of teaching. The findings also showed how the teachers critically analyzed and problematized their earlier experiences of teaching in relation to research that they were introduced to.

In sum, although there are a few examples of studies concerned with how EC teachers learn, overall, similarly to the field of teacher professional learning related to school education, much of the literature considers what professional development in ECEC is, as well as the effectiveness of different professional development programs, rather than how it operates in promoting learning (Sheridan et al., 2009). Sheridan et al. (2009) therefore argue that more empirical research is needed to show "the process by which early childhood practitioners acquire new knowledge, skills and dispositions" (p. 387). In line with this argument, the current thesis will contribute to knowledge related to the process of EC teacher learning, based on empirical findings of how an ECEC work team collectively learn in relation to contemporary challenges in ECEC, by means of PRECEC.

Contemporary challenges in Early Childhood Education and Care

The above discussed research relates to one focus of this thesis, that is, how EC teachers learn. The following sections in this chapter will present previous research related to what the participants in the thesis learn about in order to provide a rationale for discussing these topics in the FGCs. In other words, the next sections will present previous research related to the two identified contemporary challenges in ECEC. These challenges concern the tensions visible in the relationship between teaching and play, as well as how to understand children's digital experiences in contemporary play.

The relationship between play, teaching and learning

As mentioned in the introduction of this thesis, both international research (e.g., Bodrova, 2008; Fleer & van Oers, 2018; Ilgaz et al., 2018) and research in Sweden (e.g., Björklund et al., 2018; Pramling Samuelsson & Björklund, 2023; Wallerstedt & Pramling, 2012), indicates a potential tension between teaching, learning and play within ECEC due to recent focus on academic learning at the expense of play. Some of these tensions can be traced back to philosophical ideas deriving from play theorists, such as Rousseau and Froebel, arguing that play is pivotal to the learning and development of children (Cutter- Mackenzie et al., 2014). In their review of historical, philosophical, and theoretical informants to ECEC, Cutter-Mackenzie et al. (2014) writes about, for example, Rousseau's ideas of how the child's development and learning is optimized when the child is allowed to explore, driven by his or her own interest without the disturbance of an educator. These ideas continue to be visible in Froebel's theorizing on the importance of play for children's learning where the teacher's role is to only intervene in a sensitive manner (Cutter-Mackenzie et al., 2014). The idea of teachers' minimized role in play discussed above and an increase of research showing the opportunities for teaching and learning through play (e.g., Pramling et al., 2019) has resulted in tensions visible in research concerning the relationship between teaching and play. This relationship has been studied from different approaches, such as focusing on EC teacher's views on this relationship in addition to empirical studies concerning how EC teachers handle this relationship in practice. Studies from these two approaches will be presented in the following sections of this chapter.

Early childhood teachers' views on the relationship between teaching, play and learning

When it comes to research related to EC teachers' views on the relationship between teaching, play and learning, the philosophical ideas described above become apparent. For example, in a recent extensive international systematic research review regarding EC teachers' views on what is referred to as play-based learning, the authors found that many EC teachers express that there is a natural link between play and learning. In other words, that learning occurs naturally when children play (Bubikova-Moan et al., 2019). Moreover, the authors found that EC teachers express that they have little knowledge regarding play theories and play-based learning in addition to feeling insecure about when and how to become involved in children's play. These findings are also apparent in a study by Walsh et al. (2019) conducted in Northern Ireland where children at the time of the study started school at the age of four years meaning that they, at an early age, are part of a school system with an academic curriculum with focus on academic content and assessment. 100 primary schools had the opportunity to try a new play-based curriculum and the data in the study derives from interviews and observations from this moment of transition. The findings illustrate the teachers' views and experiences from the new play-based pedagogy approach. Most of the teachers argued for a non-participatory approach since they perceived that play belongs to children and that children learn and develop best without the interference of an adult. Some of the teachers on the other hand, expressed more of an over-participatory role in children's play. These teachers were skeptical to play as a mean for academic learning and expressed insecurity in terms of their role in play, mainly due to not having the opportunity to learn about how to participate in play. Moreover, there was a third group of teachers who expressed, what the authors term, an appropriately participatory role. These teachers described an approach to teaching in play where the teacher is at times responsive and at times intentional in their interaction with children in play activities (Walsh et al., 2019).

The two above mentioned studies concern EC teachers' beliefs regarding play, teaching and learning from an international perspective. However, since the concept of teaching was added to the national curriculum for preschool in Sweden in 2018 (Lpfö18, 2018) it becomes important to present studies concerning EC teachers' views related to this concept also in a Swedish ECEC context. Apart from a report from the Swedish School Inspectorate (2018), showing that EC teachers express a resistance towards the concept of teaching in preschool in addition to equating teaching and learning, there are studies where the findings

indicate that teaching is a concept which EC teachers find difficult to implement in the play-based context of preschool. One of these studies is a qualitative study investigating how EC teachers reason about teaching the youngest children in preschool (Jonsson et al., 2017). The data derives from focus group conversations and the findings illustrate how two discourses, one of demands and one of rights, become visible when the EC teachers talk about the concept of teaching. The authors point to a changing preschool discourse when describing how the findings show tensions, not only between discourses but also within them. For example, teaching in preschool is by the participating teachers considered as something that the children and parents are entitled to. At the same time, the teachers expressed concerns that teaching might turn preschool into a more school-like organization, where for example play would be excluded. In a similar vein, Henriksson (2022) found that the nine preschool teachers in her study discussed the concept of teaching in many, sometimes contradictory ways. Moreover, in a quantitative study, Vallberg Roth (2018) has investigated what may characterize teaching in ECEC in Sweden. 243 preschool teachers and managers from 10 municipalities participated in the study by providing written descriptions of their views on teaching in preschool in a survey. The findings illustrate eight traces[9] regarding what may characterize teaching in ECE, ranging from rejection to recognition. This shows that among EC teachers, it is not clear what teaching in preschool should look like and some of these findings are in line with the report from the Swedish School Inspectorate (2018). For example, in terms of rejecting the concept of teaching or equating it with the concept of learning (Swedish School Inspectorate, 2018; Vallberg Roth, 2018).

Taken together, the studies above indicate that EC teachers find it difficult to know when and how to participate in children's play in addition to experiencing challenges in terms of how to understand the concept of teaching in an ECEC context. In the following part of the chapter, empirical studies of how EC teachers handle the relationship between teaching, play and learning in practice will be presented.

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[9]   The author "…use the term 'trace' in the analysis rather than 'category', for example, because 'trace' can be analytically compatible with different premises and perspectives that shift between qualitative and post-qualitative approaches and ways of relating to and processing data" (Vallberg-Roth, 2018, p. 6-7)

Empirical studies of the relationship between teaching, play and learning in practice

The focus of this thesis is the relationship between *teaching* and play. However, previous research that has investigated the relationship between play and *learning* where adults interact with children is still of relevance for the thesis since it provides insights into how the adult can support learning within play, hence how teaching can be carried out in a play-based context. Studies focusing on play and learning will therefore appear in this literature review. Historically, in research (and in practice), play and learning have been kept apart (Pramling Samuelsson & Johansson, 2006). However, a growing body of literature has investigated the relationship between play and learning with a focus on the adult or teacher's role in supporting learning related to play. Early research within this field shows that learning and play in ECEC are not to be regarded as two separate activities. For example, Pramling Samuelsson and Johansson (2006) analyzed playful interaction between children and teachers in two situations common in preschool – mealtime and children's play – and found that dimensions of play and learning were found in each of them. The authors therefore concluded that play and learning are inseparable dimensions in ECEC. Later research related to play and learning shows how learning can take place in ECEC without losing its play-based character. For example, Wallerstedt and Pramling (2012) found that, in spontaneous play, children gradually acquired the concept of 'time'/'metre' introduced by the teacher in a previous lesson. In line with Pramling Samuelsson and Johansson (2006) above, the authors conclude that instead of focusing on the idea of play and learning as two separate activities, research should focus on how teachers make it possible for children to appropriate cultural tools. Even more recent research has addressed the relationship between learning and play. In their study, Magnusson and Pramling (2018) investigated how an activity between a 6,5-year-old and an adult evolves in a (child-initiated) conversation regarding the child's drawing 'Numberland'. By analyzing a video-sequence of the activity through a socio-cultural perspective, the authors draw the conclusion that it is possible for an adult (e.g., a teacher) to support the play while at the same time actualizing and engaging the child in content-based knowing. Collectively, these studies outline how, in play, there are opportunities for learning and the teacher's role matters in terms of supporting this learning.

While the above mentioned studies have focused on the relationship between play and learning in relation to a learning content, in a recent systematic research overview, how EC teachers can support and stimulate children's social abilities

through play have been investigated (Swedish Institute for Educational Research, 2019). In the review, the participating studies are divided into three categories of how EC teachers support the development of children's social abilities through play: directing, participating as well as observing and reflecting. When it comes to participating in play, the findings of the review illustrate that when participating in children's play, teachers must be responsive to the children's intentions in order to not disturb the play.

In terms of the tensions between play, teaching and learning presented so far, these can be found not only in teachers' views on this relationship but also within the research community. For instance, in contrast to the findings discussed above, that is, that it is possible for EC teachers to teach a learning content while at the same time promoting play, Nilsson et al. (2018) argue that this idea can be regarded as *play for learning*. They conclude that this approach to play and teaching includes a focus on formal and school based learning as well as a view that children only learn from teaching, resulting in an exclusion of other activities that the child engages in on its own. They instead argue for *play as learning* which would include a broader understanding of learning as something more than merely cognitively school based learning. Many of the studies in this chapter argue that play and learning should not be regarded as two separate dimensions and that the teacher can support children's learning and development when participating in children's play. However, Nilsson et al. (2018) argue that this reasoning per default results in an unfortunate separation of learning and play. They exemplify this by turning to an animal play situation with a group of children and a teacher. The children give (wrong) suggestions to what kind of animal they are playing with, and the teacher corrects them. Instead of viewing the situation as teaching taking place through play, the authors argue that what kind of animal they are playing with is not relevant for the play but for the content that the teacher is teaching. The teacher is therefore separating imagination and reality in addition to separating play and learning and is accordingly using children's play for teaching purposes. Based in this reasoning, the authors argue for "a reconceptualization of early childhood education that understands learning and development not as an outcome, primarily, of instruction and teaching, but as an outcome of play and exploration" (Nilsson et al., 2018, p. 231).

Moreover, in addition to the empirical studies discussed above, there is also research presenting perspectives on teaching and its relation to play and learning where these perspectives are more or less based on empirical findings (e.g., *Developmental Education Curriculum* (van Oers & Duijkers, 2013); *Guided play* (Ilgaz et

al., 2018); *Conceptual Play* (Fleer, 2011). These perspectives have in common that they theorize how it is possible for EC teachers, by participating in play, to teach a learning content without turning play into non-play. The perspectives above are complemented with a more recent theoretical framework deriving from a combined research and development project resulting in the theoretical framework of PRECEC (Pramling et al., 2019). Empirical findings from this project indicate that opportunities for teaching is made possible when preschool teachers actively participate in play with children. These studies were conducted in Sweden by researchers in close collaboration with preschool teachers who video-recorded themselves while attempting to participate in play activities with children. The video-recordings were then analyzed together with the researchers. In an article presenting PRECEC (Pramling & Wallerstedt, 2019), the authors describe play as something that participants signal to each other through fluctuations between *as if* (fantasizing and imagining) and *as is* (recognized knowledge). Teaching is understood as an activity in which both children and preschool teachers are mutually engaged, and which has particular characteristics (see below). PRECEC offers conceptual tools to analyze and understand the relationship between teaching and play. The framework was developed in relation to a Swedish preschool context and has resulted in articles written in Swedish. These articles became focus for the readings[10] of the ECEC work team participating in the present thesis project. In this perspective, play is not understood as something that teaching should be based on, instead, teaching is inherently responsive to play, indicating a difference from the more commonly found term in ECEC research literature, play-*based* pedagogy (Pramling et al., 2019). Important to note here is that learning and teaching, while related, are not synonyms, as can be seen in the research literature presented above (cf. Swedish School Inspectorate, 2018). Pramling and Wallerstedt (2019) write that even if learning and teaching relate to each other, it is analytically important to separate the concepts in order to relate them in a meaningful way. Learning is a broad concept, and it is possible to say that you always learn something from situations and interactions. In other words, a person can and do learn much without being part of a teaching situation; hence, learning is not synonymous with teaching (Pramling & Wallerstedt, 2019). This means that while PRECEC is a theory concerned with teaching in response to play, inevitably, learning will be part of a discussion on the relationship between teaching and play.

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[10] See Method and Methodology for further description.

To sum up, recent research tells us that EC teachers are unsure about how to handle the relationship between play, teaching and learning. Their views can be traced back to philosophical arguments regarding that the adult should not intervene in children's play in order to not disturb the natural learning and development taking place. However, while sometimes questioned, empirical studies of EC teachers participating in children's play contest these fears and illustrate how there are opportunities to support academic learning content and social abilities without turning play into non-play. The purpose of this thesis is not to demonstrate these findings again. Instead, the purpose is to investigate how an ECEC work team learn about one of the contemporary challenges discussed in this thesis, that is, how to understand the relationship between play and teaching, by means of PRECEC, a conceptual framework for taking on this challenge.

Since the participants in this thesis project discuss a theoretical framework concerning how to be responsive to children's intentions in play, it becomes important to review research concerning challenges related to children's experiences in play today. The next part of this chapter will therefore present research related to what can be referred to as contemporary play, often mediated by technology.

Contemporary play

In a historic review of children's play, Corsaro (2004) shows how children's play has changed through history alongside societal development. The review was written in 2004 and it ends with a call for more research on what effects digital media have on children's play. Since then, research related to this topic has grown and it has become evident that since digital media and popular culture are linked to activities in everyday life, such as play, children's experiences of these are of importance when discussing contemporary play (Nilsen, 2018; Stephen & Edwards, 2018). For example, Ågren (2015) studied how different events from media (e.g., from TV and Youtube) become meaningful expressions in children's play and interaction. It therefore becomes important to consider and to try to understand children's experiences of media and their perspective on the use of digital media when teachers talk about play and teaching in ECEC. The following sections in this chapter will therefore present research related to EC teachers' views on digital media and play as well as empirical studies and perspectives of how children use and interact with digital media in play situations. Early research within the field of children's use of digital media has been polarized in terms of

focusing on the negative (e.g., Cordes & Millers, 2000) or positive (e.g., Clements & Sarama, 2002) impact that digital media might have on children's development and learning (Stephen & Edwards, 2018). This is also evident in more recent debate, especially related to screen time, for example in the form of conflicting guidelines in terms of how to use digital media with children (Straker et al., 2018). The dichotomy is often discussed in terms of children's use of digital media as risks or benefits, a discussion seldom based on scientific grounds (Nilsen, 2018). These different views become evident in research on EC teachers' views on digital media and play presented below. In terms of digital media and play in practice, a third approach has become apparent, that is, to empirically study what is actually happening when children use digital media instead of focusing on what could or should happen when children use digital media.

EC teachers' views on digital media and play in early childhood education and care

Research related to EC teachers' views[11] on the role of digital media in ECEC is growing (Palaiologou, 2016). While not all studies presented in this section have investigated EC teachers' views on digital media in ECEC specially related to play, some findings show that play is discussed by the teachers participating in the studies and are therefore still of relevance.

The polarization between digital media in ECEC as risk or benefit discussed above is visible in studies on EC teachers' views regarding this topic where many studies show that teachers are skeptical towards integrating digital media in preschool, especially when discussed in relation to play (e.g., Schriever et al., 2020). For example, in an international study conducted in five countries, Palaiologou (2016) found that most of the participating teachers showed positive attitudes towards digital media in their personal lives. However, when it came to discussing digital media in relation to a play-based pedagogy in preschool, they expressed concerns that digital devices would hinder children's traditional play. They discussed play as something that children engage in by being active and in direct contact with their surrounding physical environment. Digital media at the same time, were discussed as being static and constructed in a way that directs the child and does not allow for interaction, hence, regarded as hindering any kind of play-based pedagogy. Similarly, in a more recent study, Gjelaj et al. (2020) found that EC teachers in Kosovo expressed a resistance towards the use of digital media in

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[11]   The terms views, attitudes, beliefs, and perceptions are commonly used within research on this topic and will throughout this chapter be used in accordance with how the authors of the presented studies use them.

preschool. While not investigating teachers' beliefs on digital media in relation to play specifically, the findings show that in terms of children's development, the teachers preferred that the children were engaged in what they called authentic play rather than using digital media as these would harm the child's development.

In contrast to EC teachers' views on digital media in preschool as a threat to play, findings from a quantitative study illustrate how most of the participating teachers believed that play and digital media should be integrated into ECEC (Nikolopoulou & Gialamas, 2015). When analyzing questionnaires answered by 190 EC teachers in Greece, the authors found that this view was stronger for teachers who had fewer years of teaching experience in addition to having a high computer self-efficacy.

While the studies presented so far provide findings indicating that EC teachers are either against or for the use of digital media in relation to play in ECEC, Mertala (2019a) shows that whether digital media are regarded as a positive or negative feature of ECEC, depends on if they are discussed in relation to education, care or socialization. The data in the study consist of essays written by preservice teachers and the findings suggest that the same preservice teacher can discuss digital media in ECEC both as something negative and positive. For example, when discussed in relation to education, digital media was regarded as providing opportunities for learning and development, while when discussed in relation to the activity of play (as part of the frame socialization), the same preservice teacher could express that digital media could hinder traditional play. In a meta-ethnographic synthesis of qualitative empirical studies, the same author (Mertala, 2019b) presents similar findings showing that education, care and socialization all have an important role in EC teachers' beliefs for or against the integration of digital media in preschool.

In addition to the studies presented above, a few studies have investigated how interventions related to integrating digital media in ECEC promotes change in teachers' practices regarding the use of digital media in relation to play in preschool. For example, Nuttall et al. (2019) investigated change in EC teachers' curriculum decision-making related to the integration of digital media into their practice. In their study, the researchers explored the relationship between cultural tools, in the form of a 'web-map' in which the concept of convergence was mobilized to foster digital and popular culture play, and the teachers' objective motives. This was investigated by conducting individual interviews with the teachers after they had implemented the use of the 'web-map'. The findings indicate that it is not possible to understand changes in practice without, at the

same time, consider the teacher's objective motives. Building on this study, in a more recent article, the researchers explored the idea of multimodal play as a threshold concept for supporting EC teachers in changing practices in relation to children's interests in digital media (Grieshaber et al., 2021). In addition, Vidal-Hall et al., (2020) examined how one EC teacher at the beginning of participating in the study expressed concerns about using digital media to support children's learning and development in a playful manner. After attempting to introduce different kinds of digital media in her practice with the children and when reflecting over this in interviews with the researcher during a period of 18 months, the authors found that the teacher had changed her beliefs in terms of expressing a more positive attitude towards the use of digital media. This change then resulted in a change regarding how the teacher interacted with the children and digital media. An important point that the authors make is that the reluctance to integrate digital media in her practice was not related to her lack of skills but instead to her beliefs related to how digital media might promote learning and development.

In regard to a Swedish ECEC context, studies on EC teachers' views on digital media are scarce. However, the studies that do exist are in line with the international research presented above showing that teachers can regard digital media as both a threat to the play-based context of preschool and as providing opportunities to learn through play. For example, early research within this field shows that teachers regard digital media as a threat to play which is viewed as a more important activity than using for example computers (e.g., Ljung-Djärf, 2008). In line with these findings, more recent research illustrates how EC teachers, when discussing digital media in relation to democracy in ECEC, expressed that play is a more important means for learning about democracy than digital media (Enochsson & Ribeaus, 2020). In contrast to these studies, Marklund (2019) found that most of the participating teachers in his study conveyed a positive attitude towards digital play in preschool as they saw a need to prepare children for a digitalized society. However, the teachers also discussed challenges in terms of explaining the pedagogical purpose of digital media to caregivers in addition to expressing insecurities about how much digital media should be used in preschool and how they can be used in order to support learning and development.

Taken together, the research presented here points to that, even though some teachers find digital media to be useful in preschool, many teachers regard it as challenging to integrate them in an ECEC context, especially in relation to play. A few studies point to how interventions related to integrating digital media in ECEC

promotes change in teachers' beliefs and practices regarding the use of digital media in preschool, which is somewhat in line with the focus of the current thesis. However, while these studies have provided findings regarding for instance one individual teacher (Vidal-Hall et al., 2020), the current thesis will contribute with findings concerning a work teams' collective learning about how to understand children's digital experiences.

Digital media and play in practice

As discussed in the beginning of this chapter, the polarization regarding if digital media are to be regarded as a risk or a benefit for children is not only evident in teachers' views on this matter but also in research on children's use of digital media (e.g., Cordes & Millers, 2000; Clements & Sarama, 2002). Already in 1999, Nicola Yelland criticized this polarization when she argued that digital elements are part of children's contemporary play and the division between digital and traditional play is therefore not a fruitful one; instead, a new enunciation of play is needed (Yelland, 1999). Building on the idea that there should be no separation between digital and non-digital play, Stephen and Edwards (2018) discusses the need for a new term – *blended play* – when arguing that play-based learning is pivotal in a digital age; however, new ideas are needed in relation to what children will play about and what constitutes play (Stephen & Edwards, 2018). In line with this reasoning but in a more recent study, Wernholm et al. (2023) discuss hybrid play based on four empirical examples of children playing with digital technologies in preschool. The authors argue that hybrid play can be understood in terms of a playground including both physical and digital elements where digital and analogue tools are intertwined in a manner in which the play activity can only be regarded as one common activity, that is, not as digital nor analogue play.

Examples of how children blend digital and non-digital play can be seen in empirical studies. For example, Danby et al. (2017) have explored how children's play intersects with technology and pretend play by analyzing how children use technology in their everyday life. Through Conversation Analysis, the authors analyzed a video-recorded sequence of two boys playing in their home. This kind of detailed analysis provide findings showing how meaning and the use of object is jointly constructed by the two children. More specifically, how a computer speaker becomes a machine for constructing imaginative guns that are attached to a toy truck. While this study focused on a play activity in the home environment of children, Hatzigianni et al. (2018) have investigated children's use of computer tablets in play in a preschool context in Greece. The study was conducted with 16

children who were introduced to a computer tablet for the first time. The findings show that when the children used the computer tablet in play, a technological dimension was added to the play, making it more social and complex. Moreover, the computer tablet was not turned into something else, instead it was adapted to the children's social reality. The authors therefore draw the conclusion that digital media are not to be considered as a threat to play. In this study, the researchers used a digital play framework developed by Bird and Edwards (2015). The framework was developed as a response to the challenge of understanding the use of digital media in ECEC settings and it suggests indicators for how children learn to use digital technologies as cultural tools. In addition, Kjällander and Moinian (2014) have also studied children's interaction with computer tablets in preschools. The authors conducted a detailed multimodal analysis and found that children's use of applications on the computer tablet is creative and how, within the dimension of play, children transform digital media intentionally. This transformation is discussed in terms of children as playing producers rather than learning consumers.

Moreover, Arnott (2016) provides research indicating that the issue of children's use of digital media in preschool is complex. By departing from an ecological perspective, the author shows how digital media are one of many elements in a complex preschool system and they can therefore not be regarded as artifacts that on their own support or teach children. Moreover, the findings show that while digital play is complex, it is not unique to any other kind of play, which means that teachers should plan for playful experiences where digital play is not regarded as an activity on its own. Instead, digital media should be regarded as tools contributing to enhancing play.

The studies presented so far have focused on children's use of working digital media in relation to play. However, as has become evident in more recent research, how children use imaginative technologies in play is of importance when trying to understand children's digital experiences in play (Bird, 2020). By departing from a Vygotskian understanding of play, Bird (2020) explored how children in two preschools in Australia use imaginative technologies in play. The findings illustrate how the children either accept the technology in play (e.g., non-functioning computer tablet or smartphone) or use another prop to represent such an artifact if not available in their play environment. A third way was for the children to create what they needed for their play. The author argue that the study shows how children learn to be active citizens in the digital world they are part of.

In addition to the research focusing on EC teachers' views on the use of digital media in ECEC and empirically studies of digital media use in the preschool practice outlined above, some scholars are starting to argue for that ECEC is entering the postdigital (e.g., Edwards, 2022). This means that attention should be directed towards how digital technologies and practices are intertwined with peoples' actions and interaction, and in the context of ECEC, what implications this have for children's learning and development.

In sum, empirical studies show that children use digital media in play in different ways whether teachers (or other adults) find this as enhancing their play or as hindering 'traditional play'. Again, the purpose of this thesis is not to illustrate that EC teachers find it challenging to understand and use digital media in preschool, especially in play. Instead, one focus of the thesis is to investigate how an ECEC work team learn about one of the contemporary challenges discussed in this thesis, that is, how to understand children's digital experiences in play, by means of PRECEC.

Chapter 3 Theoretical Framework

In this chapter, I will outline the key concepts and theoretical arguments for a sociocultural perspective on learning to be used as a theoretical framework when investigating how an ECEC work team collectively learn about contemporary challenges by means of PRECEC. The first part of this chapter will shed light on a sociocultural perspective on learning more generally. The second part will focus more specifically on *cultural tools* followed by a discussion on the *appropriation* of cultural tools. *Mediation*, *re-mediation* and the part that language plays in learning will then be introduced. The final part contains a discussion on *scientific* and *everyday concepts*. Since the presented concepts are part of a framework, they relate to each other and can therefore not be neatly separated under specific headings but will rather appear intertwined throughout this text.

A sociocultural perspective on learning

The origins of a sociocultural perspective[12] (also referred to as cultural-historical theory) mainly lies in the work of Lev S. Vygotsky (e.g., 1978). One of his main contributions to the field of educational psychology was his perspective on learning and development as always situated in a social and cultural context, in contrast to being derived from individualized processes only. Important to mention is that there is not only *one* sociocultural theory[13]. Daniels et al. (2007) argue that there are at least three established perspectives that sometimes overlap; (i) the changing participation framework (cf. Lave & Wenger, 1991) (ii) activity theory (cf. Engeström, 1987) and (iii) the semiotic mediation of cultural tools framework (cf. Wertsch, 1998). The focus of the present thesis will mainly lie within the third perspective and especially its focus on the appropriation and mediation of cultural tools.

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[12] This perspective is commonly used when studying learning and communication in ECEC. However, it has also been used in studies concerning adults' learning and communication (e.g., Nilsen, 2009)

[13] The term 'theory' is mainly used in international research taking a sociocultural perspective, indicating a fixed explanation for how learning and development occurs. However, in this thesis, the term 'perspective' is primarily used as it indicates a provision of concepts defined in relation to each other to be used for analyzing empirical data rather than an explanation for how the participants learn.

Although research related to sociocultural perspectives consists of different strands, they have a common focus on thinking, communication and learning as processes shaped by culture where understandings are jointly constructed (Mercer & Littleton, 2007). In other words, social interaction is seen as the core of the development of cognitive processes (Vygotsky, 1978). These cognitive processes include, for example, understanding, thinking, and reasoning in addition to mediated perception (hearing, seeing in culturally informed ways) and are referred to as *higher mental functions*. All these higher mental functions are argued to be mediated by social interaction (Mercer & Littleton, 2007).

Furthermore, there are many perspectives that can be used to explain learning, where each perspective has different ways of defining the object of inquiry and the unit of analysis (Säljö, 2009). The object of inquiry in this thesis is how an ECEC work team learn together and as language plays a central part in a sociocultural perspective (this will be explained further below), the unit of analysis for the present thesis is mediated activity (cf. Säljö, 2009; Wertsch, 1994), which concretely means analyzing a set of social activities (focus group conversations) with a focus on how an ECEC work team learn about teaching, play and children's digital experiences in preschool, by means of PRECEC. In other words, the unit of analysis is a social activity, meaning that learning on an individual level is not approached analytically in this thesis. This is due to that, within a sociocultural perspective, that people learn together when participating in practices is a theoretical premise. From this perspective the question is therefore not whether someone learns but rather what and how they learn. This means that what and how the individuals learn from participating in FGCs will differ. For example, one participant might take the role of a listener while another might speak more. This understanding of learning has implications for how the social activity is analyzed when for example selecting extracts for analysis. For example, that one participant speaks more than the others in the selected extracts does not mean that this participant learns more. Of importance for this thesis is therefore that knowledge claims about individual learning will not be made, instead, focus is directed towards the collective learning processes of the participating ECEC work team.

Cultural tools

From a sociocultural perspective, learning is contingent on the external social and material environment in which a person acts. There is therefore not a clear division between the material world and an individual's thinking, a division that can be

found in for example behavioristic theories. Instead, artifacts and cultural productions are in mutual contact with people and this contact in turn shapes thinking (Jakobsson, 2012). These artifacts and cultural productions are referred to as cultural tools and do not only have to be physical but can also be intellectual (Vygotsky, 1978) (a number of terms are used to refer to such tools, such as psychological or discursive). Both physical and intellectual tools are regarded as having been created to solve different kinds of problems. Put differently, they contain knowledge gains represented by the accumulated experiences of many generations (Säljö, 1991). Vygotsky argued that depending on the nature of the tools (physical or intellectual), they mediate different kinds of activities. A physical tool (for example a spade) will mediate object-oriented activities whereas intellectual tools or signs "functions as a means of social or intrapersonal discourse" (Wells, 2007, p. 245). This distinction has been criticized by more recent scholars (e.g., Säljö, 2013; Wertch, 1998) who argue that some tools can be regarded as both physical and intellectual. The written language is an example of this since it can be both intellectual in terms of grammar as well as physical in terms of text (Säljö, 2013). Another example concerns a spade, which can function as a physical tool when using it for digging in the garden while at the same time function as an intellectual tool or a sign if used to mark where on the ground a person should continue digging if that person is, for example, taking a break (Wells, 2007). That tools tend to serve both intellectual and material functions is the reason why they are both subsumed under the term cultural tools. According to Vygotsky (1978), the most important tool for human development is language (this notion will be discussed further in the section Language, mediation and re-mediation below).

Of interest in this thesis is how the participants (an ECEC work team) appropriate and use both physical and intellectual tools. This means that video-recordings and research literature as well as concepts are regarded as cultural tools, or in the case of PRECEC, a "tool-kit" (Wells, 1999) as it contains many related concepts. In Article I especially, video-recordings and research literature are viewed as cultural tools when investigating in what ways cultural resources introduced into FGCs mediate the work team's understanding of the concept of metacommunication. In Article II, focus of analysis is directed towards PRECEC and language as cultural tools when the participants reason about the teacher's role in play. Finally, in Article III, PRECEC is regarded as a cultural tool when the participants reason about integrating digital media into their practice.

Appropriating cultural tools

The study of how humans learn is of major interest in a sociocultural perspective. Learning is understood in terms of appropriation, which in this context refers to the process of learning by gradually taking over a cultural tool through participating in cultural practices (Säljö, 2009). Differently put, appropriation is a process of "taking something that belongs to others and making it one's own" (Wertsch, 1998, p. 53). That is, we are introduced to new tools in cultural and social contexts and then make them our own. Important to note here is that knowledge and experiences are made visible between people in communication and through this are made available to others. These experiences thereafter become part of each individual's thinking; a process theoretically referred to in terms of appropriation (Säljö, 2015). This notion builds on Vygotsky's idea of internalization and how higher mental functioning develops, that is, that learning and development start on an intermental level (in social interaction) and continue on an intramental level. This is referred to as the law of sociogenesis (Vygotsky, 1978). While Vygotsky wrote about these processes in terms of internalization, later scholars (e.g., Wertsch, 1998) have suggested that appropriation as a metaphor for learning should replace the former. This is because appropriation implies something being done by the learner rather than something happening to the learner. Moreover, internalization implies a dichotomy between 'outer' and 'inner', which is not in line with the sociocultural perspective used in this thesis (cf. above on cultural tools). Appropriation would in this sense better represent the dynamic learning processes as described within a sociocultural perspective.

It is important to point out that cultural tools (for example a conceptual framework) are not easily appropriated and normally includes resistance (Wertsch, 1998). Moreover, appropriation is a process that can be seen in a longer perspective – such as learning a language – a development that can take many years (Säljö, 2013), or in a shorter perspective when, for example, learning a concept in a couple of lessons or even during an interview that lasts for 15 minutes; the latter theoretically referred to as microgenetic development (cf. Wallerstedt et al., 2014). In addition, some complex tools are never fully appropriated, that is, we never fully master complex tools such as language or a musical instrument.

In sum, to study learning from a sociocultural perspective requires to study a process and not a product. In the present thesis, the process of appropriation is studied from a perspective of eight months in the first data generating and for three months in the second data generating. The concept of appropriation has, in

this thesis, been used as an analytical tool mainly in Article I since, in accordance with how it is described above, it proved helpful for analyzing the process of learning a concept. While not prevalent, it also appears in Article II and Article III.

Language, mediation and re-mediation

A point of departure in a sociocultural perspective is that it is not possible to study learning as isolated processes; instead, when studying learning from this perspective one must encompass cultural tools and social practices (Säljö, 2014). In other words, the unit of analysis when studying learning processes must attend to the way humans use cultural tools (both intellectual and physical) (Säljö, 2009) where these cultural tools are regarded as mediating our contact with the world (Wertsch, 2007). Mediation is therefore a central concept within sociocultural perspectives, and it suggests that people are not in an immediate, uninterpreted and direct contact with the world. Instead, we handle the world by using intellectual and physical tools, which function as integrated parts of social practices (Säljö, 2014). In terms of learning, this means that our actions and thinking are shaped by and through cultural tools which is why these tools become decisive for how we learn, develop and reason in given situations (Wertsch, 1998). The relationship between mediation and learning can therefore be discussed in terms of how learning entails acquiring cultural tools or mediational means and how to coordinate these with the extra-linguistic reality (Säljö, 1991). In addition, as mentioned previously, cultural tools contain the accumulated experiences of many generations and can therefore be regarded as containing inhered meanings. This means that people do not appropriate cultural tools in themselves, but rather the inhered potential or the mediational possibilities in those tools (Jakobsson, 2012).

Furthermore, although mediation is described throughout Vygotsky's texts, he elaborated with the idea of the concept, and it is therefore difficult to find a clear definition (Wertsch, 2007). When it comes to the present thesis, mediation will mainly be discussed in terms of semiotic mediation, which focuses on language as pivotal for how we make sense of the world (Wells, 2007). According to Vygotsky (1978), language is the most important tool for human development, especially its communicative and metacommunicative functions. Important to note is that language in this perspective is not limited to verbal speech but also includes other semiotic means such as gestures. However, verbal language is a particularly important tool since it can also be used as a meta-tool (we can talk about how we talk, how we gesture etc.).

Moreover, Säljö (2014) writes that, from a sociocultural perspective, to use language is not understood merely as the ability to define concepts or expressions. Instead, language is regarded as a tool used by people in interaction to create meaning. Learning, from this perspective, does therefore not concern internalizing abstracts concepts in a vacuum. It is rather related to appropriating discursive tools and through appropriating these tools, people have the possibility to understand phenomena in a more nuanced way, or in other words, learning entails mastering tools to mediate reality (Säljö, 2014). Regarding the current thesis, PRECEC is regarded as a cultural tool, and an overarching analytical focus has been on how an ECEC work team reasons about the relationship between teaching and play as well as children's digital experiences in preschool, by means of PRECEC. In line with above discussion on mediation and learning, this means that learning does not entail appropriating PRECEC as abstract concepts in a vacuum, rather, learning in this sense relates to the interaction between PRECEC as a mediational mean containing inhered meanings, and the participants' thinking and actions. Important to note is that, for the purpose of this thesis, cultural tools in the form of text and video-recordings have also been regarded as important when studying the learning processes of the participating ECEC work team. For example, of special interest in Article I is how texts (articles on PRECEC), video-recordings (of the participating EC teachers taking part in play with children), mediate the participants' understanding of the concept of metacommunication. In Article II, the main analytical focus has been on the mediating role of PRECEC and language when the work team reason about the teacher's role in play. Finally, in Article III, the interest lied in how the meaning the work team gave to PRECEC mediated their reasoning about the integration of digital media in preschool.

In addition, as mentioned previously, the introduction of cultural tools mediates our understanding of the world (Wertsch, 2007) and since this thesis, among other things, concerns the introduction of a new cultural tool in the form of a theoretical framework (PRECEC), it is relevant to discuss the concept of *re-mediation*. This concept has been interpreted and discussed by different scholars outside of sociocultural traditions (e.g., Bolter & Grusin, 1999; Prior et al., 2006). In this thesis, the concept is understood from a sociocultural perspective, meaning that it relates to how humans can learn to understand phenomena in qualitatively new ways (Säljö, 2013). According to Cole and Griffin (1986), re-mediation means "a shift in the way that mediating devices regulate coordination with the

environment" (1986, p. 113)[14]. In other words, when people use new mediating devices (physical or discursive), these devices or cultural tools contribute to forming actions and thinking in new ways (Säljö, 2013). Säljö (2013) exemplifies this process with a person using a software, computer, and a printer to create a table, something that was previously done with pen and paper. Put differently, the software, computer and printer are regarded as mediating devices that contribute to shaping the activity of creating a table in a qualitatively new manner. Another example within professional discourse, concerns how, if for example, introduced to new literature on 'free play', re-mediation could concern to go from reasoning about play as 'free from adults' intervention' to children being 'free to' (van Oers, 2014) take play in an unpredictable direction, that is, the idea of 'free play' is understood in a qualitatively new way. In relation to this process, Cole (1996) argues that people are not to be regarded as blank slates when engaging in activities, as their behavior has been mediated by language and other cultural tools, hence the prefix 're' in re-mediation.

The concept of re-mediation, as understood from a sociocultural perspective, has been discussed on a theoretical level (e.g., Cole, 1996; Cole & Griffin, 1986; Engeström, 1987; Miettinen, 2012; Säljö, 2013), in addition to be used analytically. For example, Nilsen et al. (2022) investigated how artifacts mediate and re-mediate children's engagement when playing analogue and digital games and Nuttall et al. (2019) explored how the introduction of a new cultural tool (a 'web-map') re-mediated EC teacher's curriculum decision-making. In this thesis, re-mediation has been useful when analyzing the process of the shift in the work team's reasoning about the teacher's role in play, when introduced to PRECEC. As indicated previously, from a sociocultural perspective, learning is mediated by cultural tools. For this thesis, this means that, theoretical concepts in the form of PRECEC are understood as cultural tools mediating the participants' understanding of the relationship between play, teaching and children's digital experiences. In Article II, this infer that, while mediation sheds light on how the participants, for example, reason about their role in play, re-mediation has been used as an analytical tool to understand how they change their way of reasoning about this role, through the mediating role of language, when discussing a theoretical framework with implications for teachers' role in play. This use of re-mediation also makes visible

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[14] When Cole & Griffin (1986) discusses re-mediation, they do it in relation to remedial education (see also Kozulin and Gindis (2007) and the case of literacy). Important to note is that in this thesis, re-mediation only concerns the use of the concept as a theoretical and analytical tool, that is, not in accordance with the understanding of re-mediation as an educational system.

what kind of change that occurs, especially in relation to the challenge of understanding the teacher's role in play. In other words, *that* learning is mediated is regarded as premise in this thesis, therefore, for analytical purposes, the issue of concern is *what* is being mediated and *how*.

Scientific and everyday concepts

Since this thesis relates to how an ECEC work team learns about concepts and conceptual relationships, such as play and teaching, I will in this section put forward the ideas of concept development within a sociocultural perspective, and more specifically, Vygotsky's ideas on how, what he refers to as, scientific and everyday concepts are learned.

Within a sociocultural perspective, concepts are not regarded as existing in isolation, which someone obtains just as they are. Instead, concepts are regarded as cultural tools which are mediated through language (Vygotsky, 1978). It is therefore not possible to study how someone learns a concept merely by studying when a person has defined a word as this would neglect to give information regarding how the word functions, or how the person operates with the word (Vygotsky, 1987). This means that when someone starts to recognize the meaning of a word, this is when the process of conceptual development starts, not when it ends. In other words, there is a complicated process happening, that starts when someone first hears a concept and that ends when the person has made that concept its own (Vygotsky, 1987).

Furthermore, Vygotsky (1987) makes an important distinction between everyday concepts and scientific concepts. This difference is pivotal when discussing how concepts are learned, even if the distinction can sometimes be difficult to make (Vygotsky, 1978). Everyday (or spontaneous[15]) concepts includes concepts such as brother, sister etc. that a learner learns through experiences in his or her everyday life. In contrast, what is referred to as scientific concepts are concepts that are introduced in a more formal manner (for example by a teacher in school) such as concepts related to mathematics, science etc. (even if brother and sister, to use the previous example, could be appropriated also as scientific concepts). The important issue here, according to Vygotsky (1987), is that these different types of concepts are learned in different ways. However, the two learning processes are completely interrelated. In this perspective, a person learns

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[15]   For an elaborate discussion on these concepts and the distinction between them, see Rudbäck (2020).

everyday concepts by hearing words while participating in activities and eventually, will be able to generalize to use the word in other situations. Put differently, to learn everyday concepts entails going from the concrete to the abstract. Scientific concepts on the other hand are learned by someone introducing a concept to the learner and the learning process therefore includes moving from the verbal and abstract to the concrete (Vygotsky, 1978). According to Vygotsky (1987), this means that, since scientific concepts are conveyed through other concepts in accordance with a hierarchical system, departing from a verbal definition, these concepts are easier to explain and with the help from an adult, the first ones that a child learns to master. In this way, the development of scientific concepts leads to, or prepares, the development of everyday concepts. To make a distinction between the development of scientific and everyday concepts contrasts with the common view of concept development in the 1930s, during the time of Vygotsky's writing, where this distinction was not made, instead, all concepts were regarded as developing in the same manner (Vygotsky, 1987).

In regard to the current thesis, this reasoning means that the participating teachers have appropriated everyday concepts of play and teaching, and likely also through their education, other scientific concepts of these terms (i.e., play and teaching from other theoretical points of view than from PRECEC, since the latter was not available when they carried out their educational training). However, when reading about these concepts as part of a theoretical framework in scientific journals, the teachers encounter play and teaching as scientific concepts. This means that the concepts of play and teaching are not to be regarded as either scientific or everyday concepts. Of interest is instead the movement from a concept having a sense character – that is, the personal interpretation based on a person's own experience – to the concept having meaning, which means being regarded as recognized knowledge (Vygotsky, 1987). In addition, Vygotsky's view on concept development has not been used as an analytical tool per se in the present thesis, instead it has functioned to understand what concepts are and how they develop. For example, in Article 1, the focus is on how the participants appropriate the concept *metacommunication*. In this context, *metacommunication* as a concept is not understood as fixed and existing in isolation for the participants to pick up. Instead, when the participants start to define the concept, this is when the learning process starts, not when it concludes. As described above, appropriation and mediation have been used as analytical tools when studying this process.

Summary of theoretical concepts

In this chapter I have elaborated on the theoretical concepts used in this thesis. Here, I will briefly summarize how they connect to each other. Since this thesis concerns how a work team learn about contemporary challenges, *appropriation* as a metaphor for learning is understood as gradually taking over the *cultural tool* PRECEC (cf. Article I). As a cultural tool, PRECEC contains inherent meaning that *mediate* the participants' reasoning about teaching, play and digital media in preschool. This process entails the participants both being shaped by PRECEC and its meanings and contributing to shape the same tool. Since, from a sociocultural perspective (and in this thesis), a premise is *that* learning is mediated, the point is not to establish this again, but rather to analyze *what* is being mediated and *how*. Here, the concept of *re-mediation* has filled the analytical purpose of analyzing how learning new theoretical concepts contributes to forming the work team's reasoning in qualitatively new ways. Finally, from a sociocultural perspective, learning is regarded as being able to drive development (Vygotsky, 1978). In relation to the terminology used in this thesis, this can be understood in terms of that teacher learning can drive teacher development. This means that the analytical focus is directed towards the work team's learning processes which, in for example Article 1, drives their conceptual development.

Chapter 4 Method and Methodology

This chapter will describe the method used in the thesis as well as discuss how the methodological standpoints taken relate to the theoretical framework and research questions of the thesis, that is, how concepts within a sociocultural perspective have guided the generating of data and analysis in the thesis. The chapter starts by describing the overarching design of the thesis to be followed by a section describing the method of analysis. Thereafter, ethical considerations and reflections on the trustworthiness and limitations of the thesis are presented.

Design and empirical data

In this part of the chapter, I present the design of the thesis, setting and participants as well as describe the use of focus group conversations, video stimulated recall and audio and Zoom-recordings. As this PhD thesis started out as a licentiate thesis but was developed into a PhD project, two data generating phases exist. Throughout the text, these will be referred to as the first and second data generating. Moreover, a description of and discussion on criteria for selection will not have a section of its own due to the different levels of selection (e.g., choice of preschool, teachers, when and what to video-record, what video sequences to watch). Instead, this discussion will be intertwined in the text.

Intervention in teacher learning

This thesis derives from a combined research and development project. The choice for adopting this research approach is in line with Wagner's (1997) argument that it is beneficial if teachers are involved in the research process as this would lead to generate findings that are useful for teachers. Another reason for combining research and development in this thesis relates to the argument that, collaborating with researchers might open for taking on the challenge of founding education on a scientific basis (SOU, 2018:19).

To combine research and development in this thesis, means that the design of the study can be discussed as two separate, yet intertwined parts, that is, as a research method and as an intervention in teacher learning. Concretely this means that I, as a researcher, set out with the aim of investigating how an ECEC work team learn about contemporary challenges, by means of PRECEC. The work team, however, participated in the project with the aim of learning new skills in order to develop their practice. They did this by departing from read research literature and video-sequences of themselves participating in children's play when discussing the issue of play, teaching and digital media in focus group conversations. In other words, their commitment in the project can be regarded as participating in a professional development effort in contrast to merely taking part in a research project. In a sense, the intervention can therefore be regarded both as a pedagogical strategy for teachers to learn about relevant issues for preschool practice and as a methodological strategy for researching teacher learning. To intervene in teacher learning as a way of combining research and development is, in Scandinavia, a common element in 'practice-based' or 'practice-near' [Swe: *praktiknära*] research. Although 'practice-near' research is a well-established term, it consists of various perspectives and interpretations. These different perspectives are visible in different types of research that combine research and development, such as *action research* (e.g., Elliott, 1991; Rönnerman, 2005), *lesson study* (e.g., Morris & Hiebert, 2011), *learning study* (e.g., Lo, 2012) and *design experiments* (e.g., Brown, 1992) where the element of teacher learning intervention may take different forms. The next part of this chapter will present how the intervention, in this thesis, concerns the researcher introducing PRECEC to the work team where this introduction is supported by readings and reflections on video-recordings of play and teaching activities in which the teachers participated. For more elaborate reflections on how this thesis combine research and development through teacher intervention, see the Discussion chapter.

The design of the study

The data for this thesis derive from audio and Zoom-recorded focus group conversations (FGCs) with an ECEC work team and the researcher. The first data generating (see fig. 1) consists of six FGCs conducted over a period of eight months (reported in Article I and II). To meet over the extended period of eight months was considered important when investigating learning as a process (Johnson & Mercer, 2019). The first FGC was based on research literature on

PRECEC (Pramling et al., 2019), while the other five were based on video-recordings of the teachers participating in play with children. The research literature consisted of articles from a special issue on PRECEC in a Swedish peer-reviewed journal for teachers, *Forskning om undervisning och lärande* (Research on teaching and learning). As described previously, the conceptual framework of PRECEC relates to the challenge of teaching a learning content while at the same time promoting play in the sense that it theorizes how to create opportunities for teaching within play without turning play into non-play (Pramling et al., 2019; Pramling & Wallerstedt, 2019). The participants in the present thesis therefore read two articles from this special issue prior to the start of the FGCs. One article describes the theoretical underpinnings of PRECEC (Pramling & Wallerstedt, 2019) and the other is an empirical study (Björklund & Palmér, 2019). Later, based on the participants' wish to learn more about metacommunication, an additional article (Lagerlöf et al., 2019) was added after FGC 3. During the eight months, the participants also attended lectures, both on-line and at the University of Gothenburg, regarding PRECEC[16].
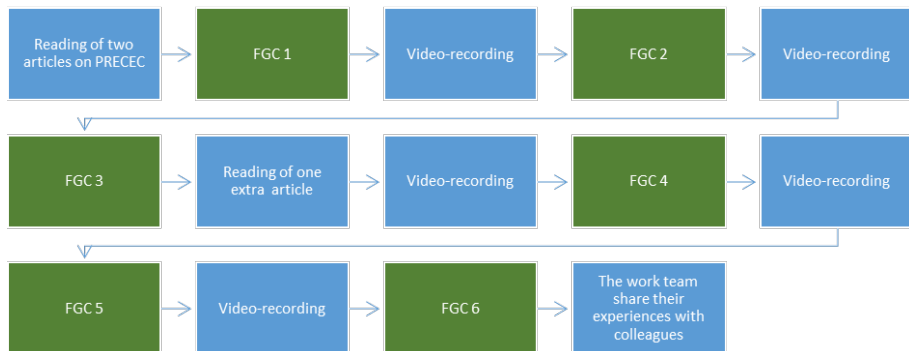
Figure 1.
The design of the first data generating conducted over a period of eight months resulting in six FGCs to be analyzed.

The first data generating made it possible to study how the work team learned about the relationship between teaching and play. However, as discussed in the chapter on previous research, it has become evident that since digital media and popular culture are linked to activities in everyday life, such as play, children's experiences of these are of importance when discussing contemporary play. The

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16   For a thorough description of the two data generating phases, see Appendices 5 and 6.

first data generating did not focus on this topic and another data generating was therefore motivated in order to focus on understanding children's digital experiences in play. The second data generating (reported in Article III) is therefore regarded as a continuation of the first part of the project and consists of four FGCs conducted with the same ECEC work team and the researcher over a period of three months (see fig. 2). This time, focus was on discussing how the teachers could understand children's digital experiences in play and how to integrate digital media into their practice. The first FGC was therefore based on popular-scientific literature in the form of a book concerning the use of digital media in preschool (Nilsen, 2020) while the following three FGCs were based on sequences from video-recordings, of the teachers participating in play with children while attempting to include different kinds of digital media. The book was chosen as it, during the time of the project, was the most recent book on digital media written in Swedish and written by a prominent scholar in this field. During the three months, the participants also listened to on-line lectures and a pod-cast episode regarding digital media in preschool.

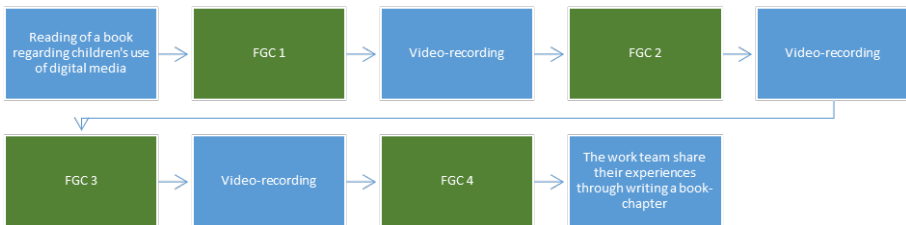**Figure 2.**
The design of the second data generating conducted over a period of three months resulting in four FGCs to be analyzed.

Setting and Participants

Both data generating phases took place in a preschool in Sweden. During the first data generating, the selection of preschool was partly based on an attempt to find a preschool located in another municipality than where I worked, due to my employer financing my research education. The preschool was found through a development leader participating in a network on PRECEC. However, the work team was not part of the network and when the project started, they were not familiar with the theoretical framework of PRECEC, but they had expressed a will

to develop their way of working with teaching and play. When asking a work team to participate in the project, I have therefore not taken into consideration selection categories such as the personnels' age or years in the profession; instead, the selection is based on an expressed will to develop their practice (in line with the combined research and development approach undertaken in this thesis project). The team worked with children aged two to three years and had worked together for six months in this constellation when the project started but some of the participants had worked together for four or five years in other constellations. The work team consists of one preschool teacher (Sofia[17]: has worked with children for twenty-seven years), one leisure-time pedagogue (Katarina: has worked with children for thirty years) and two soon-to-be childminders [Swedish: *barnskötare*] (have worked with children for fifteen (Daniela) and four (Lotta) years respectively). For the second data generating, Lotta had changed her workplace and did therefore not participate in the study.

Moreover, the video-recordings of the EC teachers participating in play with children took place in accordance with the wishes of the teachers, which normally was in the morning during indoor play activities[18]. In addition, during the first data generating, the FGCs took place in the preschool in late afternoon/evening when the children were not there. All participants sat around a table where a laptop was placed in a position so that everyone could watch the video-recorded sequences. Due to restrictions related to the COVID-19 pandemic, the FGCs in the second data generating took place over Zoom, a video-conference tool, and the participating teachers conducted the video-recordings instead of the researcher. This will be elaborated upon in the following sections.

Focus Group Conversation

A focus group is described by Wibeck (2010) as a group of people discussing a predefined topic during a limited period with a facilitator. Since the focus of the thesis was to investigate how teachers learn together, to meet in FGCs rather than conducting individual interviews was decided to be an appropriate method as it aligns with a sociocultural perspective on how meaning making happens between people and through language (Vygotsky, 1978). This line of reasoning is supported by Bourne and Winstone (2021) who argue that focus group discussions, in con-

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[17] The names presented here are pseudonyms.
[18] See the section on Video stimulated recall for further elaboration on conducting video-recordings.

trast to individual interviews, make it possibly to observe why participants might agree or disagree or how they build on the responses of others in addition to "providing a space for the generation of new ideas" (Bourne & Winstone, 2021, p. 353). Moreover, the FGCs were conducted with an ECEC work team already working together, which then constitute a pre-existing group. A benefit of using a pre-existing group, according to Wibeck (2010), is that the researcher gets insight into a social context where ideas are formed. However, a disadvantage is that issues, which the participants might take for granted, could be difficult for the researcher to understand. In the case of the current thesis, it could be argued that my previous experience as a preschool teacher was beneficial in terms of understanding the issues discussed by the participants[19]. Another difficulty related to conducting FGCs in this thesis project, concerned a low number of participants, resulting in that if someone was not able to participate occasionally, there was a risk that we could not go through with the FGCs. An attempt to handle this issue was to, at a first planning meeting, decide together that, if just one participant could not take part, we would still go through with the FGCs. An advantage of conducting the FGCs on Zoom, was that when one of the participants needed to stay home, she could still take part in the FGC from her home.

Furthermore, a stimuli material should initiate a FGC (Wibeck, 2010). In the current thesis, this means that, during the first data generating (six FGCs), the work team discussed the topic of the relationship between teaching and play where the stimuli were (a) recent research literature on PRECEC (Pramling et al., 2019)[20] and (b) selected sequences of video-recordings, conducted by the researcher. In terms of the second data generating (four FGCs), the stimuli consisted of (a) popular-scientific literature regarding the use of digital media in ECEC settings and (b) selected sequences of video-recordings of teachers attempting to include different kinds of digital media in play. Due to restrictions related to the COVID-19 pandemic, the video-recordings conducted during the second data generating were conducted by the participating teachers.

Moreover, the overarching approach has been for the teachers themselves to decide what to focus on in the FGCs as guided by their own questions and reflections, stemming from the read literature and the video-recorded sequences. In the FGCs, the researcher attempted to take more of a Socratic role, asking open-ended questions (cf. Carr & Kemmis, 1986). The teachers' involvement in the decision

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[19]   For a discussion on the researcher's participation in the FGCs, see Ethical considerations and Reflections on combining research and development.

[20]   See Introduction and Previous Research for further description.

making process in the FGCs and their participation in the research project overall, as well as the role of the researcher, will be discussed in the section concerning combining research and development provided in the Discussion chapter. In addition, for a more detailed overview of what issues that were decided to focus on in the FGCs, see Appendices 5 and 6.

Moreover, the first six FGCs were audio-recorded[21] whereas the last four were recorded through Zoom. When conducted on Zoom, the participants were sitting together in the preschool and the researcher was at home (except for one occasion when one of the teachers was participating from her home). In total, 10 FGCs were conducted, and they lasted for approximately one hour each. All FGCs have been transcribed verbatim.

Video stimulated recall

Stimulated recall is a common method to use when interested in teachers' comments on their own work (Calderhead, 1996). The idea is to show a teacher a video-recording or play an audio-recording of him or her teaching in order to stimulate a commentary upon the teacher's thought process at the time of the recording (Calderhead, 1981). One scholar who has used stimulated recall in his research is Haglund (2003) and he argues that it is necessary to problematize the thoughts and assumptions underlying it. For example, it becomes important to clarify whether the method allows the viewer to relive the original event or if a new event is created at the time of the viewing and interview. The distinction between the participants' *recall of* and *reflection on* an event is important in the current thesis, as the methodological approach slightly differs from the original idea behind stimulated recall described above. For the purpose of this thesis, I am not investigating the work team's thought processes during the original situation. Instead, I am interested in how the participants collectively reason about the stimuli that the recorded material is providing. More specifically, how they reason about the relationship between teaching and play, including children's digital experiences in play, when departing from the selected sequences of the video-recordings, and what this indicates about their appropriation (i.e., learning) of PRECEC. Hence, the method of stimulated recall is in this thesis used as an elicitation technique (cf. Barton, 2015)

While stimulated recall has been proven fruitful for studying (EC) teachers' thought processes (cf. Wood & Bennett, 2000), there are some challenges related to this approach (Cherrington & Loveridge, 2014). For example, teachers could

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[21] See Audio and Zoom-recording for further elaboration.

feel uncomfortable viewing recorded episodes of themselves together with other participating teachers or find it challenging to critique their colleagues' actions (Cherrington & Loveridge, 2014). In terms of the current thesis, to participate in the video-recordings was voluntary and this meant that two of the four (later three) teachers agreed to participate. In addition, as the facilitator and the one responsible for selecting the recorded sequences, I attempted to choose sequences including both teachers to not contribute to a feeling of being singled out. Moreover, the work team was not used to being filmed and I therefore brought the camera for a first informal meeting for the teachers (and the children) to get familiar with it.

Furthermore, during the first data generating, the video-recordings were conducted by the researcher in accordance with what was decided with the participants during a planning meeting before the project started[22]. The participants expressed that they preferred for the recordings to take place in the morning during a time when they had organized for play. The two teachers positioned themselves in different rooms while the children moved between the rooms. I used one camera attached to a tripod which allowed me to move with the camera between the rooms. During the second data generating, the teachers recorded themselves with a computer tablet as the researcher was not allowed to enter the preschool due to restrictions related to the COVID-19 pandemic. The method of teachers recording themselves has been used in the PRECEC-project (Pramling et al., 2019). The authors describe how a benefit of this method is that it is possible to generate data of activities occurring spontaneously rather than being prepared for a researcher. However, a disadvantage was that it was difficult to identify a beginning or an end of the activity, except for when the teachers could provide this information. Similarly, there were some benefits and challenges in terms of the method used in the current thesis. For example, it could be argued that the teachers had more influence in deciding what to video-record in the second data generating in terms of conducting their own video-recordings. However, this posed some organizational challenges as the work team had to spare one teacher to perform the recordings, which resulted in one less staff member to participate in and oversee activities with the children.

Moreover, since the purpose of the video-recordings is to provide stimuli for the FGCs, the selection process has been conducted in a manner relevant for this purpose. This differs from selection processes related to generating knowledge by analyzing video-observations where selections are focused on certain information

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[22]   See Appendix 5.

in relation to the theoretical framework and research questions of the study (cf. Derry et al., 2010)[23]. In the current thesis, this means that selection has been conducted on two levels. First, the selection of what to video-record was made by the participants together with the researcher in line with what was discussed and decided upon during the FGCs. For example, in one of the FGCs, the participants expressed an interest in focusing on a spontaneous play situation indoors with focus on how and to what extent they responded to the children's intentions as well as if/how the teachers controlled the direction of the play. The video-recordings therefore took place in two rooms where the participating teachers were attempting to participate in children's play. The second level of selection occurred when the researcher selected sequences from the video-recordings to watch together with the work team during the FGCs. The main selection approach was to select sequences based on what the participants had expressed a will to discuss further (see the example above). As mentioned previously, I also attempted to select sequences of both teachers to not single out one of the teachers. In the second data generating, the teachers had the opportunity to select what sequences to watch as they were the ones conducting the video-recordings. However, they wished for the researcher to continue with the selection as they were concerned that they would focus only on instances where they had "succeeded" with what they attempted to do. In addition, in terms of selecting video-sequences, some were disregarded due to high noise levels or the quality of the video-recording being of such character that it was difficult to notice what was happening in the activity. This was sometimes the case when the participants had video-recorded themselves with a tablet computer. The selected video sequences for the FGCs lasted between four and seven minutes and we watched one or two sequences during each FGC depending on the wishes of the participants.

To clarify, the video-recordings in this thesis project functioned as stimuli for the FGCs and were therefore not analyzed to generate a result. Instead, the FGCs was the focus for analysis. The next section will elaborate on the use of audio and Zoom-recordings of these FGCs.

Audio and Zoom-recordings

The FGCs in the first data generating were audio-recorded. The choice of generating audio-recorded data is informed by the sociocultural perspective underpin-

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[23] This kind of selection will be discussed in relation to the analysis of the FGCs in the section Analysis.

ning the study[24]. As this perspective contends that language plays an important role in learning processes, audio-recordings of the FGCs were considered useful data when studying the work team's learning processes. In addition, since the thesis is concerned with studying learning processes, the design of the study needs to include empirical data in which how activities evolve can be analyzed, hence using audio-recordings as a method for generating data was decided to be an appropriate method (Wallerstedt et al., 2022). Moreover, a few of the participants were not used to being filmed and expressed that they were nervous to be in front of the camera. To audio-record the FGCs was then considered to be less uncomfortable in this context. Since I did not video-record the FGCs, it was not possible to visually detect if/when the participants referred to something happening in the video-recorded sequences that we watched during the FGCs. While transcribing the audio-recordings, I was therefore watching and transcribing the sequence simultaneously to include what instances in the sequences the participants might refer to.

As the second data generating took place during the COVID-19 pandemic, I was not allowed to enter the preschool, which was the case for many research projects during this time (see for example, Falter et al., 2022; Howlett, 2022). An alternative was therefore for the FGCs to be conducted and video-recorded over Zoom. Some issues with this alternative remained the same as with carrying out the FGCs in the preschool. For example, while watching sequences of the video-recordings, the issue of not being able to visually detect if/when participants were referring to instances in the sequences remained, as the participants were placed out of picture when I was sharing my screen in order to play the video-recording. However, some differences became evident. For example, when conducting the FGCs in the preschool, the participants were sitting around a table with a computer in front of them when watching the selected sequences of the video-recordings. When we stopped watching the sequence, the computer was still visible on the table whereas on Zoom, I shared the video-recorded sequence on the screen and when we stopped watching, the sequence was not visible anymore. One noticeable difference related to this is that, when sitting around the table in the preschool with the computer in front of them, the participants seemed to refer to the sequence throughout the whole FGC whereas when conducted on Zoom, the participants only referred to the sequence for a short period of time after we watched it. Note that this was a reflection based on observation, hence the noticeable difference is not part of the findings as presented in this thesis.

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[24]   For previous sociocultural informed research building on audio-recordings see for example Kultti and Pramling (2018).

Another reflection related to this topic concerns if it would have been possible to conduct the project through Zoom if it had not been carried out in the preschool from the beginning. When asking the ECEC work team to participate in the project through Zoom, they did not express any remarkable concerns. This could be explained by us having cooperated in the beginning of the project and therefore some trust had been established. However, it could also be related to the participants, also due to the COVID-19 pandemic, already having had experience of Zoom due to using it for meetings with caregivers and other adults who were not allowed to enter the preschool during this time.

Analysis

This part of the chapter starts with a note on transcription to be followed by a presentation of sociocultural discourse analysis as an analytical tool. Finally, reflections on interpreting data is provided.

Transcription

The first step of analysis consisted of transcribing the data generated from the audio and Zoom-recorded FGCs. To transform audio into text is an interpretive process and includes making selections which are of a practical nature in addition to being theoretically informed (Davidson, 2009). In terms of the practical aspects, this means that I have used literal conventions when transcribing, including for example, comma, points, and upper-case letters in an attempt to make it easier to read the transcripts (cf. Pramling et al., 2019). In addition, in order to clearly refer to an utterance in the analysis, the turns have been numbered. When it comes to the issue of transcribing being theoretically informed, this means that I have included information regarding length of pauses and non-word utterances (e.g., mm, ooh) in addition to marking when simultaneous speech is occurring as these instances might indicate, for example, resistance common in the appropriation process (Wertsch, 1998). In order to transcribe in a way that utterances are not misinterpreted so that the data becomes trustworthy in regard to what is actually said (Mercer, 2004), I have also marked when the transcription of words is in doubt and when utterances cannot be understood.

Furthermore, the transcribing and analysis were conducted in Swedish as this was the language spoken during the FGCs. However, since the thesis is written in English and includes articles with the aim of disseminating the knowledge generated to an international readership, the selected extracts used in the articles

have been translated from Swedish into English. In the translation process, there is a risk of losing the meaning that participants express. However, this risk is minimized as the analysis was conducted in Swedish. In addition, in order to stay as close as possible to the meaning of what has been said, the extracts have not been translated literally; instead, consideration has been taken to context. For example, in one of the extracts used in the first article, one participant expressed "*det är också ett lyft för en själv*" meaning that something has resulted in some kind of elevation for the person. However, if 'lyft' was to be translated literally, it would translate to 'lift' and the meaning of the word would have been lost. Instead, the word 'lyft' was translated to 'boost'.

Sociocultural discourse analysis

The generated data (audio and Zoom-recorded FGCs) in this thesis has been structured and analyzed through sociocultural discourse analysis (SCDA) (e.g., Mercer, 2004). As revealed by its name, SCDA is theoretically informed by a sociocultural perspective on learning and development. It is a framework developed to understand how learning and problem-solving happens collectively by paying a special interest to the cultural and social aspects of human thinking. Here, language plays a central part as a means for communicating socially (cultural tool) and for thinking individually (cognitive tool) (Littleton & Mercer, 2013). Littleton and Mercer (2013) argue that while a sociocultural perspective offers an explanation to cognitive development and learning, SCDA can help to analyze and explain how people use language to solve problems together in a creative way. The methodology was originally designed to analyze children's talk while working together in a classroom. However, it has also been used in relation to adults, when for example analyzing the professional discussions of examiners making assessments of students' work (Johnson & Mercer, 2019).

Since the interest of the present thesis concerns how an ECEC work team collectively talk about the relationship between teaching and play and how to understand children's digital experiences in play, SCDA is motivated to function as a suitable approach for analyzing the generated data. An adapted version of SCDA (Johnson & Mercer, 2019) made it possible to focus on the areas of Content, Time, Joint Intellectual Action and Impact. The area of Content includes collecting evidence of the lexical content. The area of Time relates to how shared understanding is developed over time. Join Intellectual Action concerns how participants recognize each other's thinking and use this to coordinate

understandings. Finally, Impact concerns "gathering evidence about the effect that discourse has on the cognition and behavior of the participants (Johnson & Mercer, 2019, p. 268) (see the three articles for further description of the analysis process in each article).

In addition, as part of analyzing group talk through SCDA, Mercer (2004) describes three forms of talk; *disputational talk* (disagreement and individual decision-making), *cumulative talk* (the positively but uncritical building on what the others have said) and *exploratory talk* (partners engage critically but constructively with each other's ideas). Since talk is a rather complicated process to analyze, it does not fit neat categorizations and the typology is therefore not intended to be used as a coding scheme. Instead, the typology makes it possible to analyze to what extent participants in a joint activity behave cooperatively or competitively as well as to what extent they engage in critical reflection or in the shared acceptance of ideas, an analysis that was carried out in Article I. Furthermore, when it comes to the process of selecting extracts for more in-depth analysis, this process is described in each of the three articles.

Interpreting data

One challenge of analyzing and interpreting data in the form of FGCs is related to me, as a researcher, participating in the same conversations and the potential bias this could generate. Related to this, Haraway (1988) writes about situated knowledge where she questions the idea that science can be objective in the sense that something can be studied from above. Instead, she offers a different view where, as a human it is impossible to be objective since your own perspectives always affect you. The researcher is therefore automatically part of the research; hence, it becomes important for the researcher to be aware of and write about his or her position in the research (Haraway, 1988). For this thesis, this means that I must attempt to be aware of the biases that might affect my interpretation of the data. For example, as a preschool teacher, I bring with me a view on how the preschool education should/could work and/or what constitutes play and teaching and children's digital experiences in preschool as well as what role the teacher should take in play and teaching activities. When participating in the conversations and analyzing the data, this view plays a part.

One way of trying to handle the challenge of bias has been to make it possible for other researchers to interpret the data and to, overall, make it possible to peer review during both the research process and prior to publication (Freeman et al.,

2007). To work with other researchers in this way has been made possible through continuous discussions regarding the data with supervisors in addition to discussing the research project and data at text seminars/data sessions and in research level courses, as well as in mandatory seminars conducted at the University of Gothenburg. This approach will not provide objectivity to the analysis as other researchers also bring with them their own perspectives and biases. However, as the thesis is of an interpretive nature, the goal of including other researchers in the analysis, is not to provide an objective truth but as Tracy (2010) writes, "to open up a more complex, in-depth, but still thoroughly partial, understanding of the issue" (Tracy, 2010, p. 844), and thus to arrive at intersubjectively convincing and solidly grounded interpretations.

Ethical considerations and the role of the researcher

In this part of the chapter, I will reflect upon ethical considerations related to the method and methodology of the thesis. Guillemin and Gillam (2004) argue that ethical considerations related to research can be placed within at least two dimensions. The first, *procedural ethics*, mainly concerns seeking approval from an ethics committee[25] in order to be able to start a research project. The second dimension, *ethics in practice*, relates to the (sometimes subtle) ethical dilemmas that occur during the whole research process. In line with these dimensions, I have attempted to use a reflexive approach (Guillemin & Gillam, 2004), not only to the ethical dilemmas that can be anticipated before a research project starts, but also to the dilemmas that may arise during the course of the research process. This means that I have continuously reflected on ethical issues, mainly together with my supervisors, but also together with other researchers and doctoral students. An overarching guide in this process has been to make choices in relation to the researcher's need to protect the participants of the thesis as well as to make sure that the research carried out is benefitting children and teachers in preschool (and perhaps outside the field of ECEC).

In line with Nuttall's (2022) argument on the relevance of considering ethical dimensions of research projects that include intervention in educational practices,

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[25] During the time of the first data generating, the issue of seeking approval from an ethics committee was normally not required within the field of education and this was therefore not carried out. This had become more common during the second data generating and approval was therefore sought and received (Dnr 2020-05720).

the following part of this chapter, includes reflections on two dilemmas related to conducting research together with teachers close to practice and two dilemmas concerning conducting research with young children. Overall, throughout the research project, the guidelines developed by the Swedish Research Council (Vetenskapsrådet, 2017) have been followed. For example, informed consent was sought from all participating teachers and from the children's caregivers. The participants were also informed that they could withdraw from the study at any point. Moreover, as the role of the researcher is vital to discuss in relation to ethical considerations, reflections on this will be intertwined in the text below.

Research ethics when conducting research close to practice

One of the ethical dilemmas that appeared during the research process concerned the de-identifying of the participants when transcribing and writing the thesis. When carrying out FGCs, Wibeck (2010) argues that it is important that the participants are de-identified in terms of their relation to their employer. In other words, the participants might not feel safe to express their true opinion if that opinion is in opposition of what they perceive or know to be their employers' opinion. I therefore clarified to the participants that the result would be presented in a manner where it will not be possible for them or their preschool to be identified. The dilemma arose when I was asked, by a developmental leader, to present the research project together with a few of the participants to teachers working in other preschools that were not part of the research project. Even if it is not possible to identify the participants in the transcripts, it became challenging to keep my promise of not identifying the participants during the presentation. I reflected on this issue together with my supervisors as well as with other doctoral students and after this decided to go through with the presentation. This choice was based on a sense of responsibility to share the findings of my research with personnel in other preschools in addition to the participants themselves not expressing concerns in regard to carrying out the presentation together. However, I had a meeting with the participants prior to the presentation where we talked about the challenge of de-identifying them in addition to going through my presentation with them in order for them to have the possibility to provide their thoughts. Moreover, I used pseudonyms in the presentation to not reveal who said what in the FGCs. In relation to this ethical dilemma, it can be argued that the basic rule of keeping the anonymity of participants in research, is challenged in collaboration projects as it would stop the participants from sharing their work

and experiences in different forums, which in a way could be considered unethical (Eriksson, 2018).

Another ethical issue, and perhaps the most important one, relates to my role as a researcher participating in the FGCs. The need to reflect on the roles of researcher and practitioner is vital when conducting practice-oriented research (Biesta, 2007). Biesta (2007) argues that while it is important to bridge the gaps between educational research and practice, it is equally important to keep a critical distance between the two, especially in relation to the roles of the researcher and teacher. This is due to that the different participants bring different expertise in addition to having different responsibilities and roles. Prior to the FGCs, I therefore reflected on what my role in the conversations should be. Since the focus of the thesis is on the process of learning rather than on a specific result, I had no interest in directing the conversations towards a specific result. In line with Wibecks (2010) description of a focus group containing several people discussing a predefined topic, I instead introduced a discussion on a topic (teaching and play through PRECEC and the use of digital media in play), while at the same time attempting to follow the issues and concerns raised by the participating teachers. It could be argued that the predefined topic in itself steers the conversation; however, the participating teachers had not only accepted the topic of the conversations but also expressed a will to read and discuss literature in order to learn more about the relationship between teaching and play and about children's digital experiences. Moreover, to avoid steering the conversations towards a result, I attempted to take the role of a Socratic facilitator (cf. Carr & Kemmis, 1986). This meant that I tried to act as a sounding-board against which the teachers had the possibility to reflect on issues related to teaching, play and digital media in preschool. The Socratic facilitating role was characterized by asking open questions such as: Could you develop this further? Could you give some examples of…? What does that mean to you?

Although I reflected on my role as a participating researcher prior to the FGCs, there were of course ethical challenges that arose during the research process. To transcribe the FGCs soon after they were conducted made these challenges visible for me and therefore made it possible to reflect on my role. For instance, even though I attempted to take a more Socratic facilitating role, I sensed that the participants regarded me as an expert of sorts, for example when they asked if something they said was right or wrong or when they asked what I needed for my research. This is something that has been noted in other projects that combine research and development in ECEC (Wallerstedt et al., 2023). I tried to convey

that for the purpose of the research, they could not express themselves in a right or wrong manner since I am only interested in how they reflect on and discuss the topics in the FGCs. Moreover, since I had some knowledge but not much concerning the theoretical framework PRECEC in the beginning of the project, I could not provide the "right answer" to questions. However, I contributed with suggestions on further readings or lectures related to the questions raised by the teachers. In relation to the possibility of being regarded as the expert, I clarified to the teachers, before and during the second data generating, that we bring different expertise to the FGCs and that they can be regarded as the experts within their own profession.

Research ethics and young children

Although the video-recordings of the children were merely used as stimuli for the FGCs, hence not being explicitly used to generate findings, it still is of relevance to reflect upon the involvement of two- to three-year-old children in the research project. Due to the young age of the children, informed consent was sought from both, (when applicable) legal guardians. However, the challenges of explaining the purpose of the research project to very young children remained. On the one hand, the researcher did not stage the filmed activities; instead, they were part of the ordinary daily routines organized by the teachers and the children were therefore not asked to do anything they would not normally do when spending time in the preschool. In addition, it could be argued that children in this era of smartphones and computer tablets are used to having their activities documented daily. At the same time, the presence of the researcher and the video-camera can of course not be disregarded. As Larsson et al. (2021) argue, the preschool environment is a sensitive place for conducting research and the researcher needs to be aware of this both prior to and during the data generating process (Larsson et al., 2021). For me, one way of attempting to show awareness of this, was to visit the children in the preschool with the video-camera before the filming took place to try to establish a positive relationship with the children. During this time, the children had the possibility to become familiarized with the video-camera through, for example, helping me put up the tripod supporting the camera, trying the zoom on the camera, and walking in and out of picture, making it possible for them to watch themselves and their peers on the screen connected to the camera. This process was considered important since, while the children might be used to being documented through smart phones and computer tablets, the camera used in the

research project is normally not something that teachers use to document children's activities. In relation to the challenge of explaining the purpose of conducting video-recordings to young children, I hope that this time spent with me, and the camera opened for an understanding of what the presence of the video-camera could imply. In terms of the second data generating, this process was not possible as I was not allowed into to the preschool due to the COVID-19 pandemic. Since the teachers carried out the filming, I could not make sure if the children approved of being recorded. However, since the teachers are more familiar with the children then I am and therefore could discern any discomfort, and, to document children's activities with computer tablets is a common feature of ECEC in Sweden, it is reasonable to assume that the children did not experience any harm in relation to the process of being filmed.

Another ethical challenge concerns the children's possibilities to express that they would not like to participate in the filming. Since not all the children had reached an age where they verbally could express this, it became pivotal for me as a researcher to be attentive to if the children in other ways expressed that they did not want to participate. For the most part, the children did not show any signs of discomfort in relation to the presence of the camera and me. However, at one point, one child expressed sadness due to being left at the preschool by the parent in the morning and I decided to move the camera to another room in order to protect the integrity of the child. The decision was also made since the data generated would not be fruitful in relation to the purpose of filming adult participation in children's play activities. To move the camera to another room did not pose as a problem since it was possible to film play activities in other rooms as well.

To sum up, the ethical challenges of this thesis have been reflected upon prior and during the research process. The overarching notion that has guided these reflections has been to protect the participating children and teachers while at the same time conduct research that has the potential to benefit children and teachers in preschool. Although the ethical challenges that appeared during the research process were reflected upon and handled, they could of course have been reflected upon more and handled in a different manner. However, I argue that the benefits of the research design of this thesis transcends the ethical problems that arose; these benefits being contributing with knowledge on how an ECEC work team collectively learn about contemporary challenges, which in the end hopefully will benefit children in preschool.

Trustworthiness and Limitations

The research approach taken in this thesis project can be regarded as having limitations in terms of, for example, only including one work team with four participants in the first data generating and three participants in the second. In quantitative research this would be discussed in terms of attrition, that is, a validity threat concerned with participants dropping out of the study (Shadish et al., 2002). One example of handling this limitation has been to strive for to make the participation worth it, in the sense of discussing issues that are relevant for the participants to discuss (the relationship between teaching and play as well as children's digital experiences in play). In relation to this and to the practice-oriented nature of the thesis, I have found the concept of *pragmatic validity* (Nuthall, 2004) to be fruitful to consider. This type of validity concerns if or to what degree educational research is conducted "in a way that is comprehensible and practically useful for teachers" (Nuthall, 2004, p. 273). This is in line with what Tracy (2010) refers to, as *practically significant research,* which asks questions such as: Is the knowledge useful? Does it help to make visible a contemporary problem? In the current thesis, this relates to the combined research and development approach taken and my attempt to conduct research that is directly useful for the participants of the research project, and potentially, by extension, to other teachers in preschool. One way of doing this has been to build the sample on teachers' will to participate in a research project in which the topic to discuss – the relationship between teaching and play as well as children's digital experiences – is something that the participants have expressed an interest in to develop in their practice. Important to note is that this ideal to generate knowledge useful to teachers is important to balance with the fact that in the nature of research, the ambition is to generate new knowledge (regardless of whether this is useful to someone, e.g., teachers) and with a wider reach than merely for the participants and settings participating in the research. In terms of the present thesis, this balance can be argued to be handled in relation to publishing scientific articles in peer-reviewed journals.

In addition, validity measures such as persistent observation, prolonged engagement, triangulation and member checks are relevant measures to consider in relation to the trustworthiness and credibility of qualitative research (Erlandson et al., 1993). In relation to member checks, that is, to allow the participants of the study to indicate if they recognize the reconstructions made by the inquirer, I presented the findings to the work team by the end of the project. However, this

was done after the articles were published and would preferably have been done before publication. This can therefore be regarded as a limitation of the study and something that I, as a researcher, will take into consideration in future research projects. Moreover, triangulation refers to using different or multiple sources of data, methods, investigators, and theories (Erlandson et al., 1993). Although a common validity measure in qualitative data, this concept has not been taken into consideration in relation to data, method and theory as only focus group conversations serves as data which have been analyzed through one theoretical framework, that is, a sociocultural perspective. However, the credibility of the study in relation to triangulation can be argued to be strengthen in terms of multiple investigators, that is, how the transcribed FGCs have been presented and discussed with supervisors and at text seminars with other researchers. In addition, prolonged engagement concerns when a researcher learns the culture of an organization over an extended period and by this, tempers possible distortions (Erlandson et al., 1993). Such distortions might concern the participants wanting to please the researcher. In this thesis project this was indicated when, in one FGC, one of the teachers asked me what I needed for my research when asked if there was anything else the work team wanted to discuss. Due to conducting the project over a longer period, meeting with the work team several times, this issue could be discussed continuously. Finally, persistent observation emphasizes the active role of the researcher to, for example, seize the moment (Erlandson et al., 1993) and it relates to providing depth rather than scope to a study (Lincon & Gupa, 1985). In this thesis, it can be argued that my active role in the FGCs provided me with the opportunity to seize the moment in terms of asking follow up questions, allowing for providing depth to the conversations.

Moreover, the will to participate in a project such as the one in the current thesis poses another limitation. Desimone (2009) discusses that participation in studies related to teacher learning is voluntary and often based on engagement and how this results in studies only including motivated teachers (e.g., Desimone, et al., 2006). There are therefore few studies investigating teacher learning with focus on unmotivated teachers. While this can be regarded as a limitation within the research field, a premise of the current thesis is teachers' will to develop their practice and the research project could therefore not be conducted without motivated teachers.

Chapter 5 Summary of the articles

In this thesis, a combined research and development project was carried out together with an ECEC work team. The project resulted in three articles which will be summarized here with a focus on the findings of the empirical investigations. The two first articles relate to the first part of the project in which the participants were introduced to PRECEC in relation to learning about how to understand and handle the relationship between teaching and play, that is, how to teach a learning content while at the same time promote play. The third article concerns the second part of the project in which the participants used concepts from PRECEC when reasoning about the integration of digital media into their preschool practice. This means that the data for the two first articles are based on the six first FGCs while the data for the third article is based on the four last FGCs. Both research literature and video-recordings functioned as stimuli for all FGCs.

The rationale for the three articles relates to an enhanced interest in professional development for EC teachers due to increased quality demands for the ECEC sector (OECD, 2020). The issue of professional development in ECEC has mainly been approach by studying the effects of teacher learning (Sheridan et al., 2009) which is why one focus for this thesis has been to study *how* an ECEC work team learn about contemporary challenges, by means of PRECEC (visible mainly in articles I and II). In relation to the topics the work team learned about, that is the relationship between teaching and play and children's digital experiences in play, previous research indicate that there are potential tensions between teaching and play (e.g., Björklund et al., 2018), especially when it comes to teachers' ideas on their participation in play (e.g., Bubikova-Moan et al., 2019). In addition, there has been a slow uptake of digital media in ECEC (Grieshaber et al., 2021) and many EC childhood teachers find it challenging to integrate digital media into their practice, especially when this issue is discussed in relation to play (Schriever et al., 2020). The purpose of this thesis has not been to, yet again, present similar findings, but instead to shed light on *what* an ECEC work team learned in relation to these challenges (visible mainly in Article II and III) in addition to how they learn. This has been approached analytically from a sociocultural perspective (e.g., Vygotsky, 1978) where different concepts have been more apparent in the

different articles. In Article I, focus has been on the use of the concepts of appropriation and mediation, while in Article II, the concepts of mediation and re-mediation has been more apparent. Finally, in Article III, mediation has been the most central concept. In addition, Sociocultural Discourse Analysis (SCDA) (Johnson & Mercer, 2019) was used to structure and analyze the empirical data with focus on the four areas of; *Content* (gathering of evidence related to lexical content and the coherent structures of the discourse); *Time* (how shared understanding is developed over time in a social context); *Joint Intellectual Action* (how participants acknowledge the thinking of other participants and how they use this to coordinate a shared understanding) and *Impact*, concerning "the effect that discourse has on the cognition and behavior of the participants" (Johnson & Mercer, 2019, p. 268). How the analysis was carried out will be described in the summary of findings in the three articles.

Article I

Stavholm, E., Lagerlöf, P., & Wallerstedt, C. (2021). Appropriating the concept of metacommunication: An empirical study of the professional learning of an early childhood education work-team. *Teaching and Teacher Education, 102*. 103306

This article addresses how the work team in this thesis project appropriated the concept of metacommunication, a concept from PRECEC that concerns conversations about what the situation is all about, in this case, activities of play. In the article, special focus was directed at what role research articles and video-recordings had in the learning process. The following research questions guided the analysis:

- In what ways do cultural resources introduced into focus group conversations (i.e., articles, notes, and video-recordings) mediate early childhood teachers' understanding of the concept of metacommunication, in talk?
- How does one work team of early childhood teachers appropriate the concept of metacommunication?

After transcribing the six FGCs, a first step of the analysis meant paying attention to the area of Content and concerned searching for how many times, and when,

concepts from PRECEC were used and discussed. Here, it became clear that metacommunication was a central concept for the participants in the FGCs. In terms of the area of Time, focus was on how the learning process took place over eight months. Within the third area, Joint Intellectual Action, attention was paid to how different cultural tools, mediated the work team's understanding of metacommunication and how the participants used texts and video-recordings to coordinate their thinking. This part of the analysis built on the sociocultural theoretical framework of the thesis with a special focus on learning through appropriating cultural tools. Within the fourth area, Impact, an interest was directed towards how the participants, in the FGCs, applied the concept of metacommunication to their own practice.

The findings illustrate how the articles, notes and video-recordings mediate a more nuanced understanding of metacommunication and how the appropriation process takes place over time. This process could be seen in four steps where the participants:

1. try to understand or grasp the meaning of the concept. Here, the text plays a central role. A crucial step in the development of their understanding becomes evident when they reason that metacommunication is something that takes place *in* the play rather than *after* it.
2. use the concept in relation to play activities in the preschool. Here, both the text and video-recordings play a central role as the participants draw argumentative conclusions by means of the concept of metacommunication while watching sequences from the video-recordings.
3. incorporate the concept in dialogue within the everyday practice of the work team. Here, the participants show how they use metaphors in order to remember the concept and to make the concept their own. To use metaphors is a well-known strategy learners use when encountering novel concepts (Pramling, 2006), and it serves as a form of bridging between something new and something more familiar.
4. use the concept of metacommunication (in contrast to trying to define it) as a tool to reflect on their work and to describe their own development in relation to the concept when they, for example, describe the concept as being at the core of their profession—what they are "good at" as EC teachers. We interpret this as expressing that they are relating the concept to their professional identity When expressing this insight, they refer to themselves as a group: "We have understood what we are good at". This

indicates that, for the teachers, the appropriation of cultural tools is a joint intellectual activity.

In sum, the findings show how there is an interplay between reading about a concept and being able to express an understanding of the concept. The interplay involves both reading about the concept and being able to draw conclusions about your own work and actions by means of the concept. Here, the use of video-recordings was vital in making this process possible.

Article II

Stavholm, E., Lagerlöf, P., & Wallerstedt, C. (2022). Re-mediation in Early Childhood Teachers' Reasoning about their Role in Play: An Empirical Study of the Learning Process of a Work Team. *Early Years,* (Online first).

While the first article focused on how the work team learned by means of text and video-recordings, the second article focused on how they learned, but with a different focus of the learning process and with an interest directed towards what they learned. The purpose of the second article was to empirically investigate how the work team changed their way of reasoning about their role in play when introduced to PRECEC. The research question addressed was:

- How do members of an ECEC work team collaboratively change their way of reasoning regarding their role in play when introduced to a theoretical framework with principles and implications for understanding this issue?

In terms of structuring and analyzing the data in accordance with SCDA, a first content analysis revealed a theme on the role of the teacher in play, a theme that resulted in three categories;

(i) *Afraid of steering the play*: when the participants reason about the balance between steering the play in a certain direction and following the children's intentions.
(ii) *Coordinating the play*: when the work team discuss their role in play as entailing merging participants' different perspectives and wishes.
(iii) *Expanding the play*: when the participants reason about their role in play being to challenge the children.

In relation to the area of Time, the analysis focused on how the participants changed their way of reasoning regarding their role in play over eight months. The sociocultural perspective approach of this thesis was used within the third area, Joint Intellectual Action, when attention was paid to how the participants built upon and responded to each other's utterances, as well as to the mediating and re-mediating role of language in the participants' reasoning around their role in play. In terms of the fourth area, Impact, the analysis focused on how the work team applied their reasoning about their role in play to their practice.

The findings indicate that while there was no linear progression in relation to the three categories, there was a shift in emphasis. This indicates that learning can be regarded as appropriating a wider repertoire rather than one understanding replacing the other. Another finding concerns how re-mediation happens on two levels, where the first level concerns how the concept of steering first is recharged with a more positive meaning. The second level concerns how this new understanding re-mediates the reasoning about the teacher's role sin play, from a fear of steering the play to more certainty regarding the importance of participating in play with children if teaching is to take place. Relevant to note here is that the sociocultural perspective framing the thesis, describes *that* mediation and re-mediation happens by cultural tools. However, with the analytical focus on the shift in the participants' reasoning, in this article, it is possible to discern first *how* re-mediation takes place when the participants are introduced to PRECEC, that is, it occurs on two levels where known concepts (steering) when charged with new meaning opens for a more nuanced understanding of the teacher's role in play. Second, the article shows indications of *what* kind of change takes place, especially in relation to the challenge of understanding the teacher's role in play. That is, certain aspects of knowledge become new in terms of that the concept of steering, when understood in a more positive manner, opens for reasoning about the importance of the teacher's role in play instead of a fear of participating in play with children as this might interfere with the children's intentions with the play.

Article III

Stavholm, E., Lagerlöf, P., & Wallerstedt, C. (2022). The mediating role of concepts for collective reasoning about integrating play, teaching and digital media in preschool: A potential for enabled agency for early childhood teachers. *Journal of Early Childhood Research, 21*(4).

This article relates to the second part of the thesis project in which the work team attempted to use concepts from PRECEC when reasoning about the integration of digital media into their practice. An interest was directed towards how appropriated tools, in the form of concepts from PRECEC, were used, in talk (that is, not how they were used in the preschool practice), to reason about the challenge of integrating digital media in an ECEC setting. In this sense, the third article has focused more on *what* the work team learned about rather than *how* they learned. The research question guiding the analysis was:

- How does the theoretical framework PRECEC mediate an ECEC work team's reasoning about play and teaching in conjunction with digital media in preschool?

After transcribing the four FGCs, a first content analysis was carried out, revealing first that the work team discussed what digital media are by referring to it in different ways where it was most commonly referred to as children's experiences of popular culture (e.g., using a projector or tablet computer to watch TV programs), followed by the use of applications on a tablet computer (e.g., Memory or an application designed to play 'café') in addition to the use of imaginative technologies in play (e.g., pretending that a toy brick is a smart phone). In a second content coding, I searched for the word 'response' [SWE:respons] in order to locate when the mediating role of PRECEC might be visible. The second area (Time) focused how PRECEC mediated the work team's reasoning about play, teaching and digital media over three months. Within the third area of SCDA, Joint Intellectual Action, close attention was paid to the mediating role of concepts from PRECEC and how these concepts were now used when discussing how to integrate digital media in preschool. Regarding the fourth area, Impact, the analysis focused on how the process of mediation showed indications for how agency emerged.

The findings illustrate how concepts from PRECEC, for the participants, mediate an understanding of;

    (i) play and teaching as responsive activities with a focus on the importance of sharing the same digital media references

    (ii) play and teaching activities as building on a mutual frame of reference, which is a challenge as children have different experiences of digital media than adults

(iii) play as including fluctuations between *as if* and *as is* and something that must include fantasy and an openness, with digital media contributing to or hindering such openness

(iv) how teaching can take shape in mutual activities where mutual experiences of digital media can be used as a starting point for teaching.

It is important to note that it is the meaning that the participants give to PRECEC that mediates their reasoning about integrating digital media into their practice, meaning that the same theory will mediate different meanings in other ECEC settings.

Moreover, the findings indicate that, through discussing theoretical concepts in FGCs, it was possible for the participants to distance themselves from (digital) activities in their practice. In sociocultural terms, this can be viewed in terms of the emergence of agency through the mediating role of concepts. That the teachers' understanding of play and teaching in relation to digital media, as mediated through concepts from PRECEC, promotes agency is important as research indicate that teacher agency is shaped by the tech industry in combination with education policy (Player-Koro et al., 2018).

Chapter 6 Discussion

This thesis set out with the aim of studying how an ECEC work team learn about contemporary challenges in ECEC by means of a theoretical framework, PRECEC (Pramling et al., 2019). The purpose of this chapter is to, not only provide descriptions of and explanations for how and what this work team learned, but instead to render a deeper discussion of the findings, in relation to the research questions of the three articles. This will hopefully clarify why these findings are relevant for the field of teacher professional learning and for anyone interested in arranging for professional development efforts in ECEC, and by extension, for the EC teachers facing challenges in their daily work of organizing for children's education. The findings will be discussed intertwined throughout the chapter and will consider what it can mean to found education on a scientific basis, teacher agency and the time aspect of professional learning. Thereafter, contributions to PRECEC are discussed which is followed by reflections on the use of re-mediation. After this, methodological reflections are discussed, followed by implications for professional development efforts. The chapter ends with suggestions for further research.

Relevant to note is that, from a sociocultural perspective, a premise is that people learn together and that we are often not aware that we learn since, for example, everyday conversations are part of knowledge formations. This means that we cannot avoid learning, hence, something to consider is what we learn in specific situations (Säljö, 2014). In the context of this thesis, it therefore becomes important to discuss what the work team learned about when introduced to PRECEC in a research and development project in addition to discussing how they learned. That is, how a specific group learned a specific content. *How* and *what* the work team learned is in this sense interrelated and the two issues will therefore be discussed intertwined throughout this chapter with some parts emphasizing one more than the other.

To found education on a scientific basis

According to the Swedish Education Act (SFS 2010:800) and the Curriculum for the preschool (Lpfö18, 2018), the education in Sweden must be founded on scientific basis. What this means for teachers is not specified in the law, but the Swedish National Agency for Education (2023) writes that, to found education on a scientific basis means that teachers should base their work (both content and method) on research results. It also means that teachers need to understand how research is conducted. The following part of this chapter will discuss examples of how an ECEC work team can meet the requirements of this law, through the findings of this thesis, in addition to problematize what it can mean to base teachers' work on a scientific basis.

Theoretical language as a scientific approach

As mentioned in the literature review, prior studies have noted that EC teachers find it difficult to understand how to teach in a preschool practice where play has a central part and is often contrasted to the idea of teaching (e.g., Jonsson et al., 2017). They also find it difficult to integrate digital media into their practice (e.g., Palaiologou, 2016). These issues have become major challenges as the main governing document for preschool, the Swedish national curriculum for preschool (Lpfö18, 2018) now states that teachers are required to teach in addition to striving for that children develop adequate digital skills. According to the Swedish National Agency for Education (2023), such challenges can be faced by applying a scientific approach to teachers' way of working. This, however, have been proven not an easy task. Many EC teachers do not consider themselves having enough knowledge to analyze and solve problems that might occur in their practice and do not consider themselves to work with a scientific approach (Swedish School Inspectorate, 2018). It could be argued that this thesis provides examples of how to go about the task of founding teachers' work on a scientific basis, through findings that illustrate how a work team learn about a theory relevant for their practice. For instance, in Article II, examples of how the participants use a theory (PRECEC) relevant for ECEC to make sense of their practice can be observable in how the teachers reasoning about their role in play is mediated by scientific knowledge (PRECEC). It therefore constitutes an example of how everyday occurrences in the practice (how to participate in children's play in a way that allows for teaching to take place without turning the play into non-play) is conceptualized in a manner that is underpinned by scientific knowledge. In a

similar vein, Article III provides an example of how, when the participants are introduced to PRECEC, they change their way of taking on the challenge of integrating digital media into their practice. They do this by using their more nuanced understanding of play and teaching as mediated by PRECEC when they reason about digital media. For example, play is understood as including fluctuations between *as if* and *as is* and something that must include fantasy and an openness. Digital media is then understood as to different degrees, contributing to, or hindering such openness, which has implications for how to reason about the integration of digital media into a preschool practice. Important to note is, that it is the meaning that the participants give to PRECEC that mediates their reasoning about the integration of digital media into their practice, that is, the same theoretical framework will have different meanings in other ECEC settings. As argued by Nuttall et al. (2019), this means that it becomes important to observe teachers' interpretations of new cultural tools as these interpretations might not be the same as the ones provided by researchers (this issue will be discussed below in relation to contributions to PRECEC). A third example can be seen in Article I and how, in the last step of the appropriation process, the participants use the concept of metacommunication to explain and relate to their own professional identity when describing how the concept is at the core of their profession.

In sum, the findings show that, to develop a professional or theoretical language is important as this kind of language is systematized and therefore allows for to make sense of new observations, and not only, the here and now. This means that theoretical language becomes important to the teachers work in practice and not only in scientific work (Pramling, 2022). To discuss theory relevant for practice is especially important in relation to a report from the Swedish School Inspectorate (2018) showing that essential parts of professional development efforts in ECEC are not perceived, by teachers, to be directed towards their needs and are not considered as useful for their work. The teachers in the report also expressed a will to learn about how to work with the areas of the curriculum, through reading and discussing relevant literature, but that due to lack of time, this is not possible. Studies also show that collegial conversations in preschool seldom include a focus on development, but rather a focus on practical issues (Alnervik & Alnervik, 2017; Swedish School Inspectorate, 2018). Although this thesis is not able to provide findings on how to organize more time for professional development, it still contributes with knowledge about how to develop a theoretical language and how this is important for not only taking on challenges that might occur in ECEC settings but also for the challenge of founding education on a scientific basis.

Professional learning and research literacy

The above discussion has focused on one aspect of founding education on a scientific basis, that is, how to base your work on research results. However, the Swedish National Agency for Education (2023) writes that research needs to be interpreted and valued, by teachers, in order to determine if it will be useful for their specific (ECEC) setting. Persson (2017) discusses this in terms of teachers needing to develop literacy about research and that developing a scientific approach to your own practice is central when attempting to found education on a scientific basis. He contrasts this approach to the more top-down strategy of informing about and implementing research results. The findings of this thesis, indicate that learning is a process that require time and engagement (see for example, Article 1 and the illustration of the process of appropriating the concept of metacommunication). In relation to increasing quality demands put on EC teachers (OECD, 2020), this suggests that, on the one hand, there must be a sensitivity towards the requirements put on EC teachers. On the other hand, as noted in the process of this thesis project, and in other projects that combine research and development (e.g., Wallerstedt et al., 2023), teachers might regard researchers as experts holding the right answers to their questions and problems (see the Method and Methodology-section for examples). However, as Persson (2017) argues, research in one topic more often than seldom, shows diverse results and therefore different solutions to the same problem. In addition, research literacy is argued to be an essential skill for teachers to have as they are often offered private professional development initiatives that seldom rests on a scientific approach (Swedish National Agency for Education, 2020). Although there are examples of literature that can help teachers to develop research literacy (see for example Persson, 2017; Swedish National Agency for Education, 2020), it could be argued that the complexity of learning about topics that are challenging, such as the relationship between teaching and play and the integration of digital media into ECEC, in relation to developing research literacy, poses a potential dilemma in terms of teachers not being the recipient of research, and having the time to learn about how research is conducted. This is an important aspect that should be taken into consideration when planning for professional development efforts.

So far, this chapter has discussed examples of how teachers can base their work on scientific knowledge. The main point is not *that* they do it but *how*, that is, how scientific knowledge in the form of a theoretical framework semiotically mediates

the work teams reasoning and their reported ways of acting with children and teaching. I have also attempted to problematize the expectations of teachers to value and interpret research results. In the following part, the issue of teacher agency will be discussed in relation to teacher professional learning.

Teacher agency

The focus of this thesis concerns teacher professional learning and especially how a work team learn together. However, as mentioned previously, of importance is also what the work team learned about, that is the contemporary challenges of understanding the relationship between teaching and play and how to understand children's digital experiences in play. As mentioned previously, these challenges are more evident since the concept of teaching was added to the national curriculum for preschool (Lpfö18, 2019) in addition to the curriculum now highlighting how teachers should strive for to create opportunities for children to develop adequate digital skills. As already stated, EC teachers are struggling with integrating digital media into their practice (e.g., Schriever et al., 2020) and with understanding how they should teach in the play-based context of preschool (e.g., Bubikova-Moan et al., 2019; Walsh et al., 2019), partly due to an increase of demand from governing policy documents. In relation to research indicating that teacher agency in ECEC is shaped by accountability demands with an emphasis in outcome-driven practices (e.g., Buchanan, 2015), it becomes important to discuss how teachers understand how they can develop and affect their profession in contrast to merely implementing politically defined goals. The issue of teacher agency in relation to taking on challenges in ECEC will therefore be discussed here. Note that the research field of teacher agency is a fast-growing field including studies with a main focus on investigating teacher agency in different manners (Cong-Lem, 2021). In this thesis, although some findings indicate that the work team develops agency, the concept has not been used as an analytical tool and the discussion put forward here could be regarded as speculative but with some relevant suggestions for further research.

Agency has been conceptualized in different ways within different research traditions in which many of the conceptualizations derive from the field of sociology, where the debate usually concerns whether people have agency or not (Lasky, 2005). Here, and especially in Article III, agency is understood from a sociocultural perspective as the ability of human beings to distance themselves from their immediate surroundings (Mäkitalo, 2016) and how, in social interaction,

cultural tools gain meaning in the activities in which they are used (Wertsch, 2007). In other words, how cultural tools shape the possibilities for action and the way in which they can influence lives (Vygotsky, 1978). This means that agency should be regarded as a process rather than something that resides within an individual. Moreover, Morselli and Sannino (2021) argue that, from a sociocultural perspective, teacher agency can be understood in relation to the process of double stimulation (Vygotsky, 1978). This refers to a process where individuals or a group intentionally can change their circumstances. This process includes how learners, when faced with a problematic situation (first stimuli) turn to artifacts – material or discursive – (second stimuli) and by doing so transform the situation to a manageable one. In relation to teacher agency, Morsello and Sannino (2021) argue that the process of double stimulation can help to investigate teachers' agency as an evolving process when teachers turn to concepts once faced with challenges. While agency has not been used as an analytical tool in this thesis, the idea of teacher agency as proposed by Morselli and Sannino (2021) is in line with findings in Article III. Here, the process of double stimulation can be translated into how the participants are faced with the challenge of integrating digital media into preschool (first stimuli) and how turning to the theoretical framework of PRECEC (second stimuli) makes it possible for agency to emerge as the meaning the work team give to PRECEC mediates their reasoning for how to integrate digital media into their preschool practice. This is observable, for example, when one of the participants, after expressing uncertainties regarding the role of digital media in preschool, conveys that "now I can say why I bring out the Ipad".

As the findings of how an ECEC work team takes on challenges in their work by collectively turning to theory, indicate or point to the emergence of agency within the work team, they can be regarded as a (small) contribution to the issue of how teacher agency can emerge in ECEC settings. The contribution is in line with previous research indicating that social activities and professional dialogue are driving forces for teacher agency (Cong-Lem, 2021). In relation to how agency, from a sociocultural perspective, concerns individuals' ability to intentionally change their circumstances, such as their conditions for ongoing development and since this thesis merely touches upon the issue of teacher agency, a relevant suggestion for further research could be to investigate (possibly in the data from this thesis) how teachers talk about changes in their practice that would create new conditions for their learning.

Teacher professional learning and the time aspect

As noted in prior studies, teacher professional learning requires time (e.g., Hellberg, 2019; Peleman et al., 2018). Taken together, the findings in this thesis are consistent with that of previous research in this matter. However, it is still relevant to discuss the time aspect of professional learning as first, the findings of this thesis can contribute with knowledge on why it takes time. Second, since many professional development efforts in preschool are still focused on providing a single lecture (Bergmark & Westman, 2022) with the expectation of teachers to gain knowledge and be inspired (Clarke & Hollingsworth, 2002), the issue of time for teacher professional learning is essential to again bring to the foreground. It is especially important to discuss as EC teachers in Sweden indicate that they don't have enough time for reflection, and that when time is set aside for reflection, this time is often filled with urgent matters (Swedish school inspectorate, 2018). International research (e.g., Cherrington & Thornton, 2015) also reports that, to arrange for time to reflect together is not easily achieved as ECEC services usually offers full-day programs. This can be regarded as an organizational issue, hence, not within the scope of this thesis. However, the findings in this thesis provide illustrations of learning processes and indications of how time matters for professional learning. For example, in Article 1, the process of learning the concept of metacommunication and learning to argue about didactical choices by means of the concept happens over a period of eight months and includes several steps where the participants actively use both text and video-recordings. In a similar vein, Article II shows how a change in reasoning about the teacher's role in play takes time as it is re-mediated at two levels, first through the concept of steering as it is filled with a more positive connotation than before and second, how this allows for the re-mediation of reasoning about the teacher's role in play. As mentioned previously, from a sociocultural perspective, concepts are not regarded as existing in isolation for someone to pick up. Instead, concept development is a complicated process, that starts when a learner hears a concept and ends when the learner has made the concept its own (Vygotsky, 1987). For Vygotsky's studies on concept development, limited time might not have been of concern. However, since EC teachers are expected to learn about scientific methods to meet prescribed requirements, as the findings of this thesis illustrate, the time aspect is relevant to take into consideration when planning for professional development.

Contribution to PRECEC

As mentioned previously, PRECEC was developed by researchers together with EC teachers to formulate a theory that could answer to the contemporary challenge of teaching a learning content within the play-based context of preschool. In this collaboration, the researchers contributed with scientific concepts, such as intersubjectivity, alterity and metacommunication, to be used for analyzing teaching and play activities (Pramling et al., 2019). However, how these concepts were understood by the participating teachers was not investigated. As mentioned previously, Nuttall et al. (2019) argue that it is important to pay attention to how teachers understand new cultural tools, instead of focusing only on how these tools are understood by researchers or policymakers. Through analyzing FGCs with an ECEC work team when they learned about PRECEC, the findings in this thesis can contribute with knowledge related to what concepts were important for the work team when taking on the challenges of understanding the relationship between teaching and play, especially in relation to children's digital experiences in play. For example, in Article I, it is indicated that, for the participants, metacommunication became a key aspect of teaching within play as it helped directing focus towards a content while at the same time it contributed to helping children understand what was happening in the play. That metacommunication became particularly important for the work team was evident in the lexical content analysis, showing that this concept, more than the others, was a major focus for the focus group conversations. While Article I has contributed with knowledge related to what specific PRECEC concepts became important for the work team, Article II shows how a new concept, 'steering', when charged with a more positive connotation, became pivotal when reasoning about the teacher's role in play. While this concept has not been used by the researchers developing PRECEC, this thesis can show indications of how it was of importance for the work team as the re-mediation of steering opened for a more nuanced reasoning about the teacher's role in play.

In addition, PRECEC has not, so far, been studied in relation to the challenge of integrating digital media into preschool. This thesis can contribute with knowledge related to this through findings about how the work team's understanding of PRECEC concepts opened for reasoning about integrating digital media into their practice in a certain manner (see Article III). That is, how an understanding of teaching activities as including responsiveness and intersubjectivity necessitates being responsive to children's digital interests and

experiences, and an understanding of play as something that must include fantasy and openness, with digital media, to different degrees, contributing to or hindering such openness (for example, how an application steers the play too much and does not allow for fantasy). These findings indicate that it could be interesting for researchers and/or EC teachers to try to use concepts from PRECEC, when concerned with learning about how to tackle challenges in ECEC, that is, challenges other than understanding the relationship between teaching and play.

Reflections on the use of re-mediation

As mentioned previously, the concept of re-mediation has been discussed in research traditions other than the sociocultural ones (e.g., Prior et al., 2006) as well as being theorized within sociocultural traditions (e.g., Cole and Griffin, 1986). Re-mediation has also been used as an analytical tool in previous studies. For example, Nilsen et al. (2021) explored the concept of re-mediation through physical artifacts and action by investigating re-mediated activities when children played analogue and digital Memory games and especially how the artefacts mediated and re-mediated the children's engagement. While the authors have focused on re-mediation through cultural tools in the form of physical artifacts, this thesis can contribute with knowledge on how to analytically investigate the re-mediation process through intellectual or discursive tools in the form of a theoretical framework, PRECEC with a special focus on the mediating role of language.

In addition, Nuttall et al. (2019) have theorized the re-mediation of EC teachers' curriculum decisions by exploring the relationship between cultural tools, in the form of a 'web-map' in which the concept of convergence is mobilized to foster digital and popular culture play, and the teacher's objective motives. This was investigated by conducting individual interviews with the teachers after they had implemented the use of the 'web-map'. Here, the findings illustrate whether the teachers had re-mediated their curriculum decision making or not, indicating that re-mediation, in this case, can be regarded as a result of a process. While this study shed light on the importance of introducing certain cultural tools for re-mediation to take place in practice, this thesis shows an example of how re-mediation can be analytically used to, in situ, make visible a process of change, that is, how the work team move from one understanding to a more nuanced understanding of the teacher's role in play. By focusing the analysis on this shift, it is possible to notice how re-mediation happens on two levels, first the concept of steering is charged with a more positive connotation and second, the work team

reason about the teacher's role in play in partly a qualitatively new manner. That is, instead of a fear of steering the play too much, the work team talk about the teacher's role in play as pivotal for teaching to take place. The latter can be understood in terms of that the work team has re-mediated their reasoning about the teacher's role in play, that is, as a result of a process. However, in this thesis, a point of using re-mediation as an analytical tool is that it has made visible a process of change by shedding light on how re-mediation happens on two levels and how one understanding does not replace another, but instead how different understandings of a phenomena are present throughout the learning process. Important to note is that *how* this shift happens can also be understood in terms of *what* aspects of knowledge becomes new, for example, that a known concept, steering, is understood in a new way. This contribution has been discussed briefly in the previous section.

In sum, the above discussion shows how there is a variety in terms of the use of re-mediation in research. This thesis contribution concerns discussing the potential of analytically using re-mediation through discursive cultural tools, to make visible processes of change and the dynamics within it.

Methodological reflections

In this part of the chapter, I will discuss some of the findings in relation to the methodological choice of studying learning as a process. This is followed by methodological reflections on combining research and development.

Studying learning as a process

Many of the findings in this thesis confirms previous research on teacher professional learning, both in school and preschool, such as that learning takes time (e.g., Peleman et al., 2018), that it is important for teachers to discuss theoretical concepts (e.g., Darling-Hammond & Richardson, 2009), and especially concepts or issues that are relevant for their practice (e.g., Bergmark & Westman, 2022). The main contribution of this thesis has been to illustrate not only *that*, but *how* these things matter. As stated previously, although there are a few examples of studies that has focused the process of learning of EC teachers (e.g., Edwards, 2007; Wood and Bennett, 2000), more research focusing on the processes by which early childhood teachers learn is needed (Peleman et al., 2018; Sheridan et al., 2009). In this thesis, this issue has been made possible by studying learning as a process rather than studying the effect of learning. Overall, when it comes to

research on learning, there is usually a distinction made between product studies and process studies (Scribner & Cole, 1973; Wallerstedt et al., 2022). In product studies the main interest lies in finding out what someone knows before and after an activity to determine the effects of learning, whereas in process studies, the main purpose is to analyze how someone makes sense of something new in an activity (Wallerstedt et al., 2022). The theoretical framework of the thesis, a sociocultural perspective on learning, in combination with the methodological choice of using audio and zoom-recordings to generate empirical data, has made it possible to study a process as it opens for analyzing the process of learning, with a special focus on studying the communication between participants (Wallerstedt et al., 2022). This in turn, has enriched our understanding of how an ECEC work team learn, which is apparent in mainly the first two articles of this thesis, but also, to a minor extent, in the third. For example, in Article I, it is illustrated how there is an interplay between reading about the concept of metacommunication and expressing an understanding of the concept, in addition to how the participants use the concept for analytical purposes of play and teaching activities in the video-recordings. In Article II, studying the process of learning made visible, not only that the teachers changed their way of reasoning regarding their role in play, but how. That is, how the re-mediation of the concept of 'steering' opened for change in reasoning about their role in play and how this process was not linear, meaning that learning entails appropriating a wider repertoire of ways of mediating rather than one way replacing the other. Article III provides additional insight into the process of learning. This process shows how the meaning the work team gives to concepts from PRECEC, mediates their reasoning regarding the integration of digital media into their practice.

The above examples are taken from the individual articles; however, since these articles are based on the same research and development project it is also possible to discern a more overarching learning process by viewing the three articles as an entirety. That is, in Article I, the work team appropriate the concept of metacommunication, a concept that appears, for the participants, to be a key aspect of how to participate in play with children. In Article II, metacommunication and other concepts from PRECEC are used to understand the teacher's role in play, specifically how teaching can take place without losing the children's intention within the play. Finally, Article III illustrates how the participants use PRECEC to take on the challenge of integrating digital media into their practice when reasoning about this issue. They do this by using the meaning of play and teaching they give to PRECEC, resulting in talking about a further

acceptance of using digital media with children. To study learning as a process can in other words make visible the complicated process of learning about a theoretical framework in addition to learning how to use this framework when reasoning about challenges that occur in practice.

Another issue to take into consideration when studying learning as a process is that it requires a more detailed kind of analysis to make visible these processes, compared to for example large scale product studies of the effectiveness of EC teacher learning (e.g., Ottley et al., 2015; Vujičić & Čamber Tambolaš, 2017). In line with this reasoning, the sample in this thesis is one ECEC work team and the knowledge claims made are in relation to the participants of this study. This in turn means that although the findings in this thesis have contributed to filling the research gap of studying the processes by which EC teachers learn (Sheridan et al., 2009), to provide empirical studies related to this topic is still an important issue for further research.

Reflections on combining research and development

Here, I will discuss some of the implications of using a research approach that combines research and development[26]. As mentioned previously, in Scandinavia, this kind of research is commonly referred to as 'practice-based' or 'practice-near' [Swe: *praktiknära*] research. This form of practice developing research can be regarded as a way of approaching a gap between educational research and educational practice[27] as well as to conduct research that emanates from problems identified in schools and preschools (Carlgren, 2020). While the methodology of the current thesis is practice-oriented and therefore shares some features with other practice development research approaches such as *action research* (e.g., Elliott, 1991; Rönnerman, 2005), *lesson study* (e.g., Morris & Hiebert, 2011) or *developmental pedagogy research* (DPR) (Pramling Samuelsson & Pramling, 2013), there are also some important differences. The design of the study is comparable mainly to action research and DPR, especially as the latter is a research approach that combines research and development specifically in ECEC. I will therefore discuss

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[26] For a more comprehensive elaboration on methodology concerning collaboration between researchers and the ECEC sector, see Wallerstedt et al., (2023)

[27] For a problematization of the educational research and practice gap, see Biesta (2007).

how the thesis combines research and development[28], partly by relating the design of the thesis project to these two approaches. Moreover, there are different standpoints regarding what action research is (Rönnerman, 2005). Since the study takes place in a Swedish preschool, the type of action research that it will be compared to, is the one described by Rönnerman (2005) as she writes from a Swedish preschool context. How the thesis combines research and development will be discussed mainly in relation to the teachers' role and the researcher's role. As the duality of combining research and development forms the aim as well as the design (Carlgren, 2020), these issues will be discussed in the text. I will then discuss aspects related to scientific contributions and contributions to developing practice. Finally, I will discuss the issue of sustainability when combining research and development.

The role of the teachers and the role of the researcher

As Wagner (1997) points to, there is often a skewed relationship between researcher and teacher in collaboration projects where the researcher is the one inquiring and the teachers work is the object of analysis and development. In this section, I will therefore elaborate on the role of the researcher[29] and the role of the teachers in terms of their involvement in the decision-making process in relation to the research questions, method, and analysis of the research project.

As mentioned above, one of the characteristics of practice developing research is that the investigated topic is related to problems that originate from school or preschool (Carlgren, 2020). In the current thesis, it can be partly argued that this is the case. Previous research from the field of ECEC shows that teachers find it challenging to understand how teaching in preschool could be implemented (e.g., Jonsson et al., 2017) as well as how to integrate digital media in preschool (e.g., Palaiologou, 2016). In relation to this, the work team was selected based on an expressed will to develop their practice in relation to teaching and play as well as to children's digital experiences. Since the FGCs concerned how to understand the relationship between play and teaching and how to understand the use of digital media in a preschool practice, it can be argued that the topics originate from contemporary challenges in preschool. However, it should be noted that part of

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[28] Note that in Article I, the research approach is referred to as 'praxis-related'. However, when reading and learning more about this type of research, I decided to refer to it as combining research and development as this would open up for a discussion in which focus might be directed more towards the research part rather than the development part of the project.

[29] For a discussion related to ethical dilemmas concerning the role of the researcher, see Ethical considerations.

the aim of the thesis concerns how the teachers learn about play and teaching and how they learn about using digital media in ECEC. In other words, the object of inquiry for the researcher is how teachers learn (where what they learn is also of importance), while the object of inquiry for the participating teachers, is how they can improve their practice by discussing the relationship between teaching and play and the use of digital media. This is an important distinction to make since it relates to whether the research is conducted *with* or *on* teachers (Cochran-Smith & Lytle, 1990). Rönnerman (2005) argues that while there are different standpoints concerning what action research is, there is general agreement that action research starts with a collaboration between practitioners and researchers, addressing the practitioners' questions. Here, focus is placed on teachers changing their practice. In the DPR approach, there is also the element of collaboration between researchers and teachers; however, the research focus is on how children develop knowledge and not primarily on teachers changing their practice (Pramling Samuelsson & Pramling, 2013). The similarities to the research approach of the current thesis consist of the collaboration between teachers and researcher. The difference lies in that the main object of inquiry is how teachers learn about contemporary challenges by means of PRECEC and not how they change their practice versus how children develop their knowledge. In sum, in relation to the aim of the thesis, it can be argued that the research is conducted *on* teachers, and this would not be in accordance with a practice developing research approach (Carlgren, 2020). However, the research in this thesis is conducted in parallel with the teachers (and the researcher) exploring an issue relevant for the teachers. This means that while findings related to how the work team learn might be relevant for the research field of teacher professional learning, findings related to what the work team learn about might be relevant for teachers organizing for education in ECEC settings (see for example Contribution to PRECEC in this chapter).

When it comes to the design of the thesis, to conduct FGCs based on research literature and video-recordings, it could be argued that the work team were not active in the decision-making process since the design of the research project was formulated by the researcher, especially in terms of the introduction of PRECEC since this relates to a premise in the research school (PRECEC_SCS) in which the thesis is written. However, before the start of the two data generating phases, the teachers and I had a planning meeting where the design of the research project was discussed in more detail. Here, the teachers had the possibility to decide when and what situations to video-record, as long as the situations concerned play and teaching, and in the second part of the project, digital media, as perceived by the

participating teachers. In other words, the teachers were involved in choosing the focus for the video-recordings as guided by their own interests, in terms of areas they wanted to develop in their work. In line with this, the FGCs departed from what the teachers wanted to explore further regarding play and teaching and children's digital experiences. In this sense, the teachers were involved in decision-making *within* the design of the project. The design of the current thesis shares some features with the DPR approach as they both use a method where the researcher is conducting video-recordings of teachers interacting with children in preschool. However, one distinct difference concerns how the video-recordings are used in relation to the object of inquiry; that is, in the DPR approach, the video-recordings are the data to be used to generate new scientific knowledge related to interaction between teachers and children (Pramling Samuelsson & Pramling, 2013). In the current thesis, however, the video-recordings are used to stimulate reflection in FGCs, and the audio-recorded FGCs are instead the generated data which was used to generate knowledge related to teacher professional learning. To use video-recordings is also common in action research; however, in many cases, the teachers are the ones conducting them and, in this sense, it is the teachers who are generating data and not the researcher (Rönnerman, 2005). Note that the teachers were conducting the video-recordings in the second data generating phase as result of the COVID-19 pandemic and could therefore be regarded as the ones who were generating data.

Furthermore, during the FGCs, the video-recordings were analyzed by the teachers and the researcher together. However, the teachers were leading the analysis while the researcher had taken more of a Socratic role, asking open-ended questions (cf. Carr & Kemmis, 1986). In this analysis process, the teachers had the possibility to steer the conversation towards what they found interesting in the video-recordings. To analyze data together is common both within action research (cf. Ljunggren, 2015) and the DPR approach (Pramling Samuelsson & Pramling, 2013). However, there are a few distinct differences. Since action research is more practice-driven, the analysis might focus more on how to change practice (Mattson & Kemmis, 2007). In contrast, the DPR approach is more theory-driven and the focus for the analysis is often on how teachers support children's learning and how children respond to this support (Pramling Samuelsson & Pramling, 2013). In the case of the current thesis, the analysis conducted together with the teachers was part of the stimulated reflection during the FGCs. However, the analysis which relates to the research questions (and therefore the focus of the thesis) is conducted only by the researcher, that is, the analysis of the FGCs focusing on

how teachers learn about contemporary challenges, by means of PRECEC. This means that any knowledge claims being made in this thesis can merely relate to how and what the work team learn or how they report on changes in practice, that is, not in relation to actual changes in practice even though these might occur.

I am aware that although practices developing research is currently popular and in demand within educational sciences, and this thesis can be argued to promote this kind of research approach, there are other ways of conducting research that contribute much to what we know about teacher professional learning. With this said, there are benefits when combining research and development in a project such as the one in this thesis. In sum, this kind of collaboration can open up for teachers to base their work on scientific knowledge. It can also generate findings that are useful for teachers (Wagner, 1997), for example, regarding the importance of reflecting over the concept of 'steering' when discussing how to participate in children's play in order for teaching to take place. However, as discussed above there are some methodological challenges and implications related to this kind of research approach. In this thesis, these can be summarized in terms of an awareness of (i) if the study is being conducted *on* or with *teachers* (ii) to what degree the teachers are involved in the decision-making process of the design, for example, what theory to learn about, how and what to video-record and finally (iii) who is conducting the analysis in relation to what is being studied. That is, are the teachers and the researcher analyzing data together or separately and for what purpose (e.g., to change practice or to generate new theories or both). When designing a research project that includes some kind of intervention in teacher learning or practices, these issues should preferably be discussed in the planning stages of the project (Wallerstedt et al., 2023) as they have implications for the findings of a study.

Moreover, the way in which this thesis project was conducted can be discussed as not setting out with predefined goals in terms of how and what the work team should learn. That is, the work team was introduced to PRECEC, but they decided what was interesting about this theory and what they wanted to learn more about. This meant that the teachers could drive the topic of discussion during each FGCs. In other words, while a decided focus was to discuss play, teaching and digital media through PRECEC, to not have predefined goals opened for a flexibility in how the project was carried out. To carry out a thesis project, including teacher learning intervention, in this manner has proven fruitful in terms of studying the processes by which teachers learn. However, while some informal positive feedback from the participating teachers was received, it might have been valuable

to have organized for structured feedback from the work team in terms of how they perceived the design of the, for them, professional development effort.

Scientific contributions and contributions to development of practice

As there are two sides of a research and development project, it is important to reflect upon the difference between scientific contributions and contributions to changing practice. Mattsson and Kemmis (2007) argue that different criteria need to be used depending on what kind of contribution one would like to evaluate. One challenge they raise, is that it is difficult for a researcher to investigate and understand the ripple effects of a research and development project. In line with this reasoning, I will here elaborate on the scientific contributions and the contribution to development of practice, in the current thesis. To do so, I will circle back to how I, as a researcher, and the participating teachers departed from different questions and aims although we were part of the same project. In other words, I was interested in how the work team learned about contemporary challenges, by means of PRECEC. The participating teachers were instead interested in how they can understand and handle the professional task of how to teach in the play-based context of preschool as well as how to understand children's digital experiences in play. Related to this, it could be argued that the three articles in this thesis are scientific contributions as they are published in peer-reviewed scientific journals. Moreover, since the articles make visible processes of collective learning as well as what the work team learned about (see above discussed contributions), they are relevant for the research field of teacher professional learning as well as for anyone interested in organizing for professional development efforts. In addition, they are hopefully relevant for EC teachers that are interested in organizing for teaching practices that are responsive to children's intentions in play, and especially children's digital experiences in play.

In terms of evaluating the development of the practice in which the teachers work, this has been proven challenging. As Mattson and Kemmis (2007) argue, "praxis-related research should leave traces not only in the academic world but also in the world of practitioners" (p. 208). This is more in line with an action research approach where the aim is "to improve practice rather than produce knowledge" (Elliott, 1991, p. 49). The question, according to Mattson and Kemmis (2007), is how this change in practice can be identified as there will always be uncertainties regarding to what degree the research was responsible for any changes, as well as uncertainties in terms of identifying the nature and quality of these changes. They continue to argue that, when evaluating any research and

development project, one needs to regard these uncertainties as inevitable. The main aim of current thesis has been to contribute with knowledge regarding how an ECEC work team learned about contemporary challenges by means of PRECEC, and the change or improvement of practice is subordinated to this. However, in line with the reasoning of Mattson and Kemmis (2007), it is important to reflect upon the development element of the research project. In this case, how the work team can be considered to have participated in a professional development program in which they read research literature, watched video-recordings, and discussed topics relevant for developing their practice. Since the development of practice has not been the main analytical focus, I cannot make any knowledge claims regarding this. However, while not reported in the findings, the participating teachers have continuously, through the FGCs, *described* how they have changed and how their practice has changed since they became part of the research and development project. In this sense, *according to the participants of the study*, development has occurred (related to this, see reflections on *pragmatic validity* discussed in the section concerning limitations of the thesis). In addition, by the end of the project, the participants wrote a chapter in a book on EC teachers' experiences of working with PRECEC (Magnusson & Pramling Samuelsson, 2023), which could be regarded as an attempt to contribute to the development of other practices than their own.

Sustainability in combined research and development projects

Sustainability is a concept often discussed in relation to projects that combine research and development (Rönnerman, 2005) and teacher professional learning (Stoll et al., 2006), and in Sweden, as a premise for founding teachers' work on a scientific basis (e.g., Swedish National Agency for Education 2020).

The issue of sustainability in research and development projects, such as the one in this thesis, is by some scholars, discussed in relation to the sustainability goals in Agenda 2030 (UNESCO, 2015) (e.g., Jonsson & Gustavsson, 2020). These goals highlight not only the pivotal role of quality education, especially in ECEC (Goal 4), but also emphasizes the importance of partnership between different levels of society and the development of collaboration and dialogue. Jonsson and Gustavsson (2020) argue that a combined research and development project that they carried out, can be regarded as including dimensions of social sustainability as collaboration and dialogue in addition to be founded on a scientific basis, functioned as important elements of the project.

Another way of discussing sustainability in relation to research and development projects is in terms of how to organize for the sustainable development of teaching practices (e.g., Swedish National Agency for Education, 2020). Within this discussion, there is a focus on the difficulties of creating such strategies, for example in relation to funding agencies setting the limit for collaboration (Wallerstedt et al., 2023). Related to this, focus could be, for example, on how to organize for long term professional development efforts or in relation to the importance of the support from the leadership.

While the different aspects of sustainability put forward above are important to shed light on, in this thesis, another aspect of sustainability in relation to research and development projects and teacher professional learning, can be discussed. This aspect concerns that no matter (or apart from) *how* such a collaboration project is organized, of relevance is *what* kind of cultural tools that are being introduced for the participants. In the project in this thesis, the work team was introduced to a theory that concerns overarching and relevant parts of their practice (play and teaching) which could be regarded as a contrast to a theory related to specific parts of their practice (e.g., theories related to mathematics or art). This thesis shows indications of how a theory concerned with overarching parts of preschool education can be used to understand more specific parts (e.g., integration of digital media). If a premise is that a person cannot unlearn something, then this opens for how the participants can use a theoretical framework, such as PRECEC, to analyze and understand various parts of their practice. In other words, the more useful a theory is, in this context, the more sustainable the use of it is. A suggestion for further research therefore concerns the investigation of how (or if) PRECEC can be used as a tool to take on challenges in ECEC other than the ones discussed in this thesis.

Implications for professional development efforts

By shedding light on how an ECEC work team learned about contemporary challenges by means of PRECEC, this thesis can contribute to understanding how to support EC teachers best, which is especially important in relation to a report from the Swedish School Inspectorate (2018) showing that professional development efforts are not systemized and structured based on the teachers' needs and does not often reach its goals. Based on the findings discussed above,

some implications to take into consideration when planning for professional development efforts are therefore here summarized.

First, as indicated by previous research (e.g., Peleman, 2018), and by findings in especially Article I and II in this thesis, to plan for long-term professional development initiatives has proven important in relation to teacher professional learning. Second, as already discussed in this chapter, it is essential to consider the significance of making it possible to discuss theory or theoretical concepts relevant for practice when planning for professional development efforts to found education on a scientific basis. Third, to study learning as a process made it possible to make visible how the participants actively worked with the research literature in terms of there being an interplay between reading and expressing an understanding. This indicates the importance of making it possible to read research literature not only before the professional development opportunity but also to actively use the literature during the professional development session. Finally, to watch sequences of video-recordings of teachers participating in play activities with children was a central part of the learning processes as it allowed for the work team to draw conclusions about their actions by means of the theoretical concepts they were learning. This points to the importance of not only making it possible to read research literature, but also to include watching and analyzing video-recordings of teachers participating in activities with children, when planning for professional development initiatives.

Suggestions for further research

This thesis set out with the aim of investigating how an ECEC work team learn about contemporary challenges in ECEC by means of PRECEC. Through the findings and the discussion of these findings some relevant suggestions for further research have become apparent and will be summarized here. First, since process studies of the kind that has been undertaken in this thesis are typically small scale, there is an overall need for similar studies in order to make visible the processes by which EC teachers learn. Second, the findings suggest that the theoretical framework PRECEC was useful for taking on the challenge of integrating digital technologies in preschool and a suggestion for future research is therefore to investigate the usefulness of this framework for taking on other challenges in other ECEC settings. It would also be beneficial to study how EC teachers learn about other theoretical frameworks and how these might matter for approaching challenges in ECEC. Third, the findings show small indications of how the work

team develops agency through the mediating role of concepts in relation to integrating digital technologies into their practice. In relation to teacher agency in ECEC, and especially agency as understood from a sociocultural perspective, a relevant suggestion for future research is to consider how teachers talk about changes in their practice that would create new conditions for learning. This thesis has shown the relevance of discussing theory in combination with watching video-sequences of activities in preschool for teacher professional learning. In terms of the aspect of teacher agency in relation to teacher professional learning, a fourth and final suggestion for further research is to further investigate how analyzing video-recordings matters in professional development efforts and how this might be a potential for developing teacher agency. That is, how teachers can take part in and affect their own knowledge development by analyzing themselves in their practice, in contrast to merely implementing politically defined goals and research stating, "what works".

Svensk sammanfattning

Inledning

Denna avhandling handlar om lärares professionella lärande i relation till samtida utmaningar i förskolan. Det är viktigt att studera lärares lärande i förskolan då lärares kompetens spelar en stor roll för förskolans kvalité (Cherrington & Thornton, 2015; OECD, 2020; Peleman m.fl., 2018). Även om det råder konsensus om att lärare i förskolan[1] behöver tillgång till kompetensutveckling har forskning hittills tenderat att koncentrera sig på effekter av kompetensutveckling snarare än hur lärare i förskolan lär (Peleman m.fl., 2018; Sheridan m.fl., 2009). Därtill kommer att förskolan är under konstant förändring, till exempel i relation till förändringar i läroplanen för förskolan (Lpfö18, 2018) vilket bidrar till ökade förväntningar på hur lärare i förskolan ska utföra sitt arbete. I denna avhandling relateras lärares lärande till två förändringar i den senaste versionen av läroplanen (Lpfö18, 2018), nämligen att begreppet undervisning tillkommit samt nya skrivningar om att förskolan ska bidra till att barn utvecklar adekvata digitala förmågor. Dessa två förändringar har resulterat i utmaningar kring att förstå undervisning i relation till förskolans traditionella syn på lekens framträdande roll (se t.ex. Jonsson m.fl., 2017) samt kring att förstå barns digitala erfarenheter och användning av digitala teknologier[2] i lek (se t.ex. Wernholm m.fl., 2023). I Sverige blir lärares professionella lärande även aktualiserat i Skollagen (SFS 2010:800) där det står att all utbildning ska vila på vetenskaplig grund. Detta betyder att en del av lärares yrke blir att kontinuerligt reflektera över arbetssätt och kunskapssyn. För att kunna göra detta krävs att lärare lär sig om vetenskapliga metoder som erbjuder verktyg för att analysera och hantera utmaningar som kan uppstå i förskolan (Skolinspektionen, 2018). I denna avhandling är ambitionen att studera lärares

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[1] Då den pedagogiska personalen i förskolan består av olika yrkesgrupper som t.ex. förskollärare och barnskötare, vilket också är fallet kring arbetslaget i studien, används personal i förskolan i denna sammanfattning som benämning av läsvänliga skäl.

[2] Digitala teknologier är en av många konceptualiseringar som används i forskningslitteraturen för att skriva om barns digitala erfarenheter. Andra konceptualiseringar är t.ex. IKT och digitala verktyg. I denna avhandling inkluderar digitala teknologier både användningen av digitala artefakter (som t.ex. datorplattor) och innehåll i populärkultur (t.ex. TV-program och/eller Youtube).

lärande i relation till de två ovan nämnda utmaningarna. I studien har ett arbetslag i förskolan introducerats för teorin lekresponsiv undervisning (på engelska Play-Responsive Early Childhood Education and Care [PRECEC]) (Pramling m.fl., 2019; Pramling & Wallerstedt, 2019). Studien blir därmed ett kombinerat forsknings- och utvecklingsprojekt. Lekresponsiv undervisning är en teori som innehåller begrepp för att förstå relationen mellan lek och undervisning. Centralt inom denna teori är att lek förstås som något som deltagarna signalerar till varandra genom växlingar mellan *som om* (fantasi) och *som är* (vedertagen kunskap). Vidare förstås undervisning som en aktivitet i vilken både lärare och barn är ömsesidigt engagerade vilket innebär att läraren måste vara responsiv på barnets intentioner i leken. Inom lekresponsiv undervisning förstås även lärares och barns samspel bland annat genom hur de upprättar intersubjektivitet och använder sig av metakommunikation.

Bakgrunden till studien är således kunskapsluckan kring hur lärare i förskolan lär, och de samtida utmaningarna att förstå relationen mellan lek och undervisning och hur barns digitala erfarenheter i lek kan tas tillvara. Denna avhandling avser därmed undersöka hur ett arbetslag i förskolan tillsammans lär sig om dessa utmaningar med hjälp av lekresponsiv undervisning. Det övergripande syftet med avhandlingen är att generera ny kunskap, genom empiriska studier, om hur ett arbetslag i förskolan tillsammans lär sig om samtida utmaningar i förskolan med hjälp av lekresponsiv undervisning. Mer specifikt rör syftet hur arbetslaget lär sig om relationen mellan lek och undervisning och hur det går att förstå barns digitala erfarenheter i lek när de blir introducerade till lekresponsiv undervisning i ett kombinerat forsknings- och utvecklingsprojekt. Avhandlingen närmar sig detta syfte genom att ställa följande forskningsfrågor i tre artiklar:

Artikel I

- På vilket sätt medierar kulturella redskap som introducerats i fokusgruppsamtal (tex. artiklar, anteckningar och videoinspelningar) ett arbetslags förståelse för begreppet metakommunikation?
- Hur approprierar ett arbetslag i förskolan begreppet metakommunikation?

Artikel II

- Hur förändrar medlemmarna i ett arbetslag i förskolan sitt sätt att resonera om sin roll i lek när de blir introducerade till en teori med principer och implikationer för att förstå lärarens roll i lek?

Artikel III

- Hur medierar teorin lekresponsiv undervisning ett arbetslags resonemang om lek och undervisning i samband med digitala teknologier i förskolan?

Avhandlingen är skriven inom ramen för den nationella forskarskolan Utbildning för lekresponsiv undervisning i förskolan för social och kulturell hållbarhet (PRECEC_SCS).

Tidigare forskning

Eftersom denna avhandling handlar om hur lärare lär sig om två av förskolans utmaningar med hjälp av lekresponsiv undervisning, kommer den tidigare forskning som presenteras här handla om lärares professionella lärande samt om de två utmaningarna, att förstå relationen mellan lek och undervisning och att förstå barns digitala erfarenheter i lek.

Studier som undersöker lärares lärande tenderar att främst fokusera på lärare i grundskolan och gymnasiet snarare än i förskolan. Dessa studier befinner sig inom ett fragmenterat forskningsfält (Kennedy, 2014) där olika konceptualiseringar används, såsom professionell utveckling eller kontinuerlig kompetensutveckling [Eng: *Continuing Professional Development*]. I denna avhandling används termen professionellt lärande snarare än professionell utveckling då den första termen avser lärprocesser i vilka lärare anses vara aktiva deltagare snarare än passiva mottagare av ny kunskap (Webster-Wright, 2009). Därtill präglas forskningsfältet av studier som beskriver och visar effekter av professionell utveckling. Det pekas därför ut ett behov av empiriska studier som fokuserar *hur* lärare lär, och speciellt hur lärare lär tillsammans (Vermunt m.fl., 2019).

Eftersom förskolan skiljer sig från skolan, bland annat genom sin organisation, blir det viktigt att beakta studier om lärares lärande specifikt från förskolan. Studier om lärares lärande i förskolan liknar den forskning som beskrivits ovan i den mening att dessa studier många gånger fokuserar effekter och beskrivningar av professionell utveckling (Peleman m.fl., 2019). Några undantag är bland andra Edwards (2007) som har studerat hur lärare i förskolan lär sig om sociokulturell teori, samt Wood och Bennet (2000) som har studerat hur lärare i förskolan lär sig om teorier om lek och dessa teoriers relation till praktiken. Sammanfattningsvis saknas det ändå empiriska studier om hur lärare i förskolan lär (Sheridan m.fl., 2009).

Av vikt i denna avhandling är också vad arbetslaget lär sig *om*, det vill säga relationen mellan undervisning och lek samt barns digitala erfarenheter i lek. Forskning som rör undervisning och lek indikerar att det finns spänningar mellan lek, undervisning och lärande. Dessa spänningar kan ses som ett resultat av att leken kan få en marginaliserad roll i takt med en ökad betoning på undervisning (Ilgaz m.fl., 2018; Pramling Samuelsson & Björklund, 2023). Spänningar kan ofta spåras tillbaka till filosofiska argument om vikten av lek för barns utveckling (Cutter-Mackenzie m.fl., 2014). Studier om relationen mellan lek och undervisning har fokuserat dels på åsikter om denna relation, dels på vad som blir synligt i förskolan praktik när det kommer till lek och undervisning. Sammanfattningsvis visar dessa studier att lärare i förskolan tycker att det är svårt att veta när de ska delta i barns lek (t.ex. Walsh m.fl., 2019) men att det finns möjligheter att stötta barns lärande i lek utan att störa leken (Pramling m.fl., 2019).

När det kommer till den andra utmaningen som tas upp i denna avhandling, det vill säga att bemöta barns digitala erfarenheter i lek, är tidigare forskning ofta polariserat då den fokuserar antingen på risker eller möjligheter med barns användning av digitala teknologier (Stephen & Edwards, 2018). Denna polarisering går till viss del att se i studier om lärares uppfattningar om barns användning av digitala teknologier i förskolan. Den största delen studier pekar mot att lärarna finner det utmanande att integrera digitala teknologier i förskolans utbildning då de ses som ett hinder för 'traditionell lek' (t.ex. Schriever m.fl., 2020). Många studier visar dock att barn använder digitala teknologier i lek på olika sätt (t.ex. Danby m.fl., 2017; Hatzigianni m.fl., 2018) oavsett om lärare eller andra vuxna anser att digitala teknologier hindrar eller gynnar barns lek. Det blir därför viktigt att undersöka hur lärare i förskolan lär sig att förstå hur barns digitala erfarenheter kan tas tillvara.

Avhandlingens teoretiska ramverk

Avhandlingen utgår från ett sociokulturellt perspektiv på lärande (Vygotskij, 1978) vilket innebär ett fokus på lärande och utveckling som socialt och kulturellt situerat snarare än som endast individuella processer. Lärande bör följaktligen studeras som en pågående aktivitet, det vill säga som process och inte en produkt. Inom perspektivet används olika begrepp för att förstå och analysera bland annat lärande och kommunikation. I denna avhandling har begreppen *appropriering*, *mediering* och *re-mediering* använts för att analysera ett arbetslags lärprocesser.

Appropriering innebär här att, genom att delta i kulturella praktiker, gradvis ta över kulturella redskap och göra dem till sina egna (Säljö, 2009; Wertsch, 1998). Vygotskij skrev om kulturella redskap som antingen fysiska artefakter eller diskursiva (t.ex. begrepp). Senare forskare (t.ex. Säljö, 2013) har nyanserat denna distinktion genom att argumentera för att vissa redskap kan vara både fysiska och diskursiva. Ett exempel på detta är det skrivna språket som kan ses som diskursivt i relation till dess grammatik eller som fysisk artefakt i form av text. Från ett sociokulturellt perspektiv relaterar lärande till hur kunskap och erfarenheter synliggörs i kommunikation mellan människor och på detta sätt blir tillgängliga för andra för att sedan bli en del av det individuella tänkandet. Att studera lärande innebär följaktligen att studera hur deltagare använder kulturella redskap. Redskap förstås som att de innehåller kunskap från tidigare generationer (Jakobsson, 2102). I föreliggande avhandling betyder detta att det analytiska fokuset riktas mot hur deltagarna approprierar kulturella redskap i form av begrepp från lekresponsiv undervisning (speciellt begreppet *metakommunikation* i Artikel 1).

Ett annat centralt begrepp inom ett sociokulturellt perspektiv är mediering. Mediering innebär att människor inte är i en direkt och otolkad kontakt med världen, utan vi hanterar världen genom att använda kulturella redskap som fungerar som integrerade delar av sociala praktiker (Säljö, 2014). Med andra ord är våra handlingar och vårt tänkande format av och genom kulturella redskap vilket betyder att dessa redskap blir avgörande för vad och hur vi lär (Wertsch, 1998). Mediering förstås här främst som *semiotisk* mediering vilket betyder att språket ses som centralt för hur vi förstår världen (Wells, 2007). Enligt Vygotskij (1978) är språket det viktigaste kulturella redskapet sett till dess kommunikativa och metakommunikativa funktion. Säljö (2014) skriver att från ett sociokulturellt perspektiv handlar inte språkets användning om förmågan att till exempel definiera begrepp. I stället ses språk som ett redskap som används av människor i interaktion för att skapa mening. Lärande och utveckling handlar med andra ord om att, genom att appropriera diskursiva redskap, förstå fenomen på mer nyanserade sätt. I denna avhandling förstås teorin lekresponsiv undervisning som ett sådant diskursivt redskap. Det innebär att ett övergripande analytiskt fokus riktas mot hur lekresponsiv undervisning medierar deltagarnas resonemang om lek, undervisning och digitala teknologier. Viktigt att notera är att i Artikel I har också fokus riktats mot hur kulturella redskap i form av text (vetenskaplig litteratur) och video-inspelningar medierar deltagarnas förståelse för begreppet metakommunikation.

I denna avhandling har också begreppet re-mediering varit av vikt för att studera hur arbetslaget i studien resonerar om lek och undervisning. Här förstås

re-mediering som "a shift in the way that mediating devises regulate coordination with the environment" (Cole & Griffin, 1986, s.113). Med andra ord, när människor använder nya redskap (fysiska eller diskursiva) bidrar dessa redskap till att forma handlingar och tänkande på nya sätt (Säljö, 2013). Re-mediering har diskuterats både på teoretisk nivå (se t.ex. Cole, 1983; Cole & Griffin, 1986) och använts analytiskt för att studera hur nya redskap medierar och re-medierar aktiviteter (se t.ex. Nilsen m.fl., 2022; Nuttall m.fl., 2019). I denna avhandling har re-mediering varit användbart för att analysera ett skifte i arbetslagets resonemang om deras roll i lek.

Sammanfattningsvis, appropriering som en metafor för lärande innebär att gradvis ta över kulturella redskap och göra dem till sina egna. Lekresponsiv undervisning förstås, i denna avhandling, som ett diskursivt kulturellt redskap innehållande kunskap och mening. När deltagarna approprierar detta redskap medierar det deltagarnas resonemang om undervisning, lek och digitala teknologier i förskolan. Att lära sig begrepp innebär alltså inte att plocka upp färdiga begrepp som existerar i isolering. Istället startar lärprocessen när den som lär sig börjar att definiera begrepp. Denna process innebär att deltagarna både blir formade av och formar lekresponsiv undervisning. En premiss i ett sociokulturellt perspektiv och i denna avhandling är *att* lärande medieras och det blir därför av vikt att studera *vad* som medieras och *hur*. Här har begreppet re-mediering varit användbart för att analysera hur lärandet av nya teoretiska begrepp bidrar till att forma arbetslagets resonemang på kvalitativt nya sätt.

Metod och metodologi

Denna avhandling utgår från ett kombinerat forsknings- och utvecklingsprojekt. Detta innebär att projektet kan förstås som två delar som hänger ihop, en forskningsdel och en utvecklingsdel. Mitt mål som forskare var att studera hur ett arbetslag lär sig om lek, undervisning och digitala teknologier med hjälp av lekresponsiv undervisning, medan arbetslagets mål var att lära sig om lekresponsiv undervisning för att kunna utveckla sitt arbetssätt och sin praktik. Arbetslaget bestod av en förskollärare, två barnskötare och en lärare för fritidshem. En av barnskötarna slutade under studiens gång.

Designen av studien bestod av två datagenereringsfaser vilka resulterade i totalt 10 fokusgruppsamtal (sex samtal i den första fasen och fyra samtal i den andra fasen). I den första fasen introducerade jag deltagarna för två forskningsartiklar om teorin lekresponsiv undervisning (Björklund & Palmér, 2019; Pramling &

Wallerstedt, 2019). Vi diskuterade sedan dessa artiklar under ett första fokusgruppsamtal där deltagarna fick möjlighet att dela med sig av vad de tyckte var svårt eller intressant att diskutera vidare. Därefter utförde jag videoinspelningar av två av deltagarna när de deltog i lekaktiviteter med barnen. Jag valde sedan ut sekvenser av dessa inspelningar som vi samtalade kring, utifrån lekresponsiv undervisning, i efterföljande fokusgruppsamtal. Andra fasen av projektet gick till på liknande sätt, men deltagarna blev denna gång introducerade för en bok om digitala teknologier i förskolan och videoinspelningarna fokuserade hur deltagarna försökte använda olika typer av digitala teknologier i lekaktiviteter med barn. Fokusgruppsamtalen i den andra fasen handlade också om lek och undervisning och speciellt hur begrepp från lekresponsiv undervisning kan användas för att försöka förstå barns digitala erfarenheter i lek. Den andra fasen genomfördes under Corona-pandemin vilket medförde att deltagarna filmade sig själv då jag inte hade tillträde till förskolan. Varje fokusgruppsamtal varade i cirka en timme och det är dessa samtal som har fungerat som det empiriska materialet i denna avhandling. Videoinspelningarna har således inte analyserats empiriskt utan har i stället använts för att stimulera reflektion i fokusgruppsamtalen (se t.ex. Barton, 2015). De första sex samtalen ljudinspelades på förskolan medan de fyra sista spelades in på Zoom på grund av den rådande Corona-pandemin.

De metodologiska val som ovan beskrivits relaterar till hur fokusgruppsamtal, till skillnad från individuella intervjuer, öppnar för möjligheten att studera en kollektiv lärprocess genom att det går att få syn på hur deltagarna bygger på varandras yttranden (Bourne & Winston, 2021). Därtill möjliggör ljud -och Zoominspelningar att empiriskt kunna studera hur deltagarna resonerar om lek, undervisning och digitala teknologier med hjälp av lekresponsiv undervisning. Alla fokusgruppsamtal transkriberades ordagrant och analyserades genom sociokulturell diskursanalys (Johnson & Mercer, 2019). Denna analysmetod möjliggör att analysera och förklara hur människor använder språk tillsammans för att lösa problem (Littleton & Mercer, 2013) genom att fokusera på områdena *Innehåll, Tid, Gemensamt intellektuellt handlande* och *Påverkan* (min översättning) [Eng: *Content, Time, Joint Intellectual Action* och *Impact*]. En analys av innehåll innebär att inventera vad deltagarna tar upp i samtalen. *Tid* relaterar till hur delad förståelse utvecklas över tid medan *Gemensamt intellektuellt handlande* handlar om hur deltagare i samtal erkänner varandras tänkande och använder detta för att koordinera förståelse. Slutligen handlar *Påverkan* om "gathering evidence about the effect that discourse has on the cognition and behavior of the participants (Johnson &

Mercer, 2019, p. 268). I varje artikel skriver jag fram mer konkret hur denna analysmetod har använts.

Vidare har riktlinjer från Vetenskapsrådet (2017) beaktats genom hela avhandlingens process, som till exempel att erhålla informerat samtycke från deltagarna. Guillemin och Gillam (2004) skriver att denna typ av etiska övervägande, och andra överväganden som beaktas vid starten av ett forskningsprojekt, kan ses som en dimension av forskningsetik. Den andra dimensionen, som författarna argumenterar för är minst lika viktig, handlar mer om de etiska dilemman som kan uppstå under ett forskningsprojekts gång. Under avhandlingsprocessen uppkom exempel på dilemman när jag och deltagarna skulle presentera projektet tillsammans för andra lärare vilket innebar en utmaning kring att säkerställa anonymiteten av deltagarna. I relation till denna typ av dilemman har det krävts att jag kontinuerligt har reflekterat över etiska frågor tillsammans med handledare och andra forskare.

Summering av artiklarna

Avhandlingen resulterade i tre artiklar publicerade i internationella tidskrifter där de två första artiklarna utgår från den första datagenereringsfasen (sex fokusgruppssamtal) och den tredje artikeln utgår från den andra datagenereringsfasen (fyra fokusgruppssamtal).

I den första artikeln (Stavholm m.fl., 2021) analyserades hur arbetslaget approprierade begreppet metakommunikation, ett begrepp från lekresponsiv undervisning som handlar om samtal om vad som sägs och görs i en situation, i detta fall i lekaktiviteter. Ett speciellt fokus riktades mot vilken roll forskningsartiklar och videoinspelningar hade i lärprocessen.

Följande forskningsfrågor guidade analysen:

- På vilket sätt medierar kulturella redskap som introducerats i fokusgruppsamtal (tex. artiklar, anteckningar och videoinspelningar) ett arbetslags förståelse för begreppet metakommunikation?
- Hur approprierar ett arbetslag i förskolan begreppet metakommunikation?

Efter att ha transkriberat de sex fokusgruppsamtalen strukturerades och analyserades materialet utifrån sociokulturell diskursanalys (Johnson & Mercer, 2019) och en första innehållsanalys (*Innehåll*) gjordes som visade att begreppet metakommunikation blev centralt i samtalen. Fokus för analys blev sedan hur

arbetslaget lär sig detta begrepp över åtta månader (*Tid*). Ett speciellt intresse riktades mot hur kulturella redskap medierade deltagarnas förståelse för metakommunikation och hur arbetslaget använde text och videosekvenser för att koordinera sitt tänkande (*Gemensamt intellektuellt handlande*). Denna del av analysen bygger på idén om lärande som att appropriera kulturella redskap. Inom området *Påverkan* fokuserades hur deltagarna applicerade begreppet metakommunikation till deras egen praktik.

Resultaten visar att approprieringsprocessen kan beskrivas i fyra steg där deltagarna:

1. försöker förstå betydelsen av begreppet metakommunikation. Här spelar texten en central roll när deltagarna utvecklar sin förståelse för begreppet genom att resonera om att metakommunikation är något som händer i leken och inte efter leken.
2. använder begreppet i relation till lekaktiviteter i förskolan. Här spelar både text och videoinspelningar en central roll när deltagarna drar argumenterade slutsatser med hjälp av metakommunikation medan de tittar på videoinspelningarna.
3. införlivar begreppet i dialog kring den vardagliga praktiken. Här börjar deltagarna att använda metaforer för att minnas begreppet och göra det till sitt eget.
4. använder begreppet metakommunikation för att förklara och relatera till sin egen professionella identitet. I relation till detta refererar deltagarna till sig själva som en grupp: "vi har förstått vad vi är bra på". Detta indikerar att för arbetslaget innebär approprieringen av metakommunikation en gemensam intellektuell aktivitet.

Sammanfattningsvis visar resultaten att det pågår en växelverkan mellan att läsa om begreppet metakommunikation och att uttrycka en förståelse för begreppet. Växelverkan involverar att både läsa om begreppet och att dra slutsatser om sitt arbete och sina handlingar med hjälp av begreppet. Här var användandet av videoinspelningarna viktiga för att göra denna process möjlig.

I den andra artikeln (Stavholm m.fl., 2022) fokuseras både *hur* arbetslaget lär och *vad* de lär genom att studera hur de förändrar sitt sätt att resonera om sin roll i lek när de blir introducerade till lekresponsiv undervisning. Forskningsfrågan som guidade analysen var:

- Hur förändrar medlemmarna i ett arbetslag i förskolan sitt sätt att resonera om sin roll i lek när de blir introducerade till en teori med principer och implikationer för att förstå lärarens roll i lek?

I linje med sociokulturell diskursanalys (Johnson & Mercer, 2019) gjordes en första innehållsanalys (*Innehåll*) där det framkom tre olika sätt att prata om sin roll i lek som delades in i tre kategorier;

(i) *Rädsla för att styra leken*: när deltagarna resonerar om balansen mellan att styra leken i en viss riktning och följa barnens intentioner med leken
(ii) *Koordinera leken*: när arbetslaget diskuterar deras roll i lek som innebärande att sammanföra deltagarnas olika perspektiv och önskningar
(iii) *Expandera leken*: när deltagarna resonerar om att sin roll i lek innebär att utmana barnen.

Analysen fokuserade hur deltagarna förändrar sitt sätt att resonera om sin roll i lek under åtta månader (*Tid*) och med ett speciellt fokus på språkets medierande och re-medierande roll när deltagarna bygger och svarar på varandras yttranden (*Gemensamt intellektuellt handlande*). Inom området *Påverkan* analyserades hur deltagarna applicerade sitt resonemang om lärarens roll i lek till sin praktik.

Resultaten visar att även om det inte fanns en linjär progression i sättet att resonera relaterat till de tre kategorierna, fanns det ett skifte i vad som betonades. Detta indikerar att lärande handlar om att appropriera en vidare repertoar snarare än att en förståelse ersätter en annan. Vidare visar analysen hur re-mediering sker på två nivåer där den första nivån handlar om hur begreppet *styra* får en mer positiv konnotation. Detta öppnar upp för den andra nivån av re-mediering som innebär ett skifte i resonemang om lärarens roll i lek, från en rädsla för att styra leken till en större säkerhet om den viktiga roll läraren har i lek för att undervisning ska kunna ske. Viktigt att notera här är att det sociokulturella perspektivet i denna avhandling ger *att* mediering och re-mediering sker genom kulturella redskap. Genom att empiriskt studera skiftet i deltagarnas resonemang går det däremot att urskilja, för det första *hur* re-medieringen sker när deltagarna blir introducerade för lekresponsiv undervisning, det vill säga re-mediering sker på två nivåer (se ovan). För det andra går det att urskilja indikationer på *vad* som förändras när det kommer till att förstå lärarens roll i lek. Med andra ord, vissa aspekter av kunskap blir nya i och med att begreppet 'styra' förstås på ett mer positivt sätt. Detta i sin tur öppnar

upp för ett resonemang om lärarens roll i lek som viktig snarare än en rädsla för att blanda sig i barns intentioner med leken.

Den tredje artikeln (Stavholm m.fl., 2023) relaterar till den andra delen av projektet där arbetslaget använder begrepp från lekresponsiv undervisning för att resonera om integrationen av digitala teknologier i förskolan. Det analytiska fokuset riktades mot hur de redskap lärarna hade approprierat användes i samtal för att resonera kring utmaningen med att integrera digitala teknologier i förskolans praktik. Här finns alltså ett tydligare fokus på *vad* deltagarna lär snarare än *hur* de lär. Forskningsfrågan som guidade analysen var:

- Hur medierar teorin lekresponsiv undervisning ett arbetslags resonemang om lek och undervisning i samband med digitala teknologier i förskolan?

I en första innehållsanalys (*Innehåll*) gick det att urskilja hur arbetslaget resonerar kring vad digitala teknologier är genom att referera till det på olika sätt (t.ex. barns erfarenhet av populärkultur, användandet av applikationer på en datorplatta eller som användningen av leksaker, som till exempel klossar, för att representera digitala teknologier). I en andra innehållsanalys sökte vi efter ordet 'respons' för att lokalisera när den medierande rollen hos lekresponsiv undervisning eventuellt blev synlig. Inom området *Tid* fokuserades hur lekresponsiv undervisning medierade arbetslagets resonemang om lek, undervisning och digitala teknologier under tre månader. Ett speciellt intresse riktades mot den medierande rollen av begrepp från lekresponsiv undervisning och hur dessa begrepp nu användes för att resonera kring integrationen av digitala teknologier i förskolan (*Gemensamt intellektuellt handlande*). I en sista del av analysen (*Påverkan*) fokuserades hur medieringsprocessen visade indikationer på hur agens utvecklades.

Resultaten visar hur begrepp från lekresponsiv undervisning medierar en förståelse för;

(i) lek och undervisning som responsiva aktiviteter med ett fokus på vikten av att dela referenser kring digitala teknologier

(ii) att lek och undervisningsaktiviteter bygger på en gemensam referensram, vilket ses som en utmaning då barn har andra erfarenheter av digitala teknologier än vuxna

(iii) hur lek innebär växlingar mellan *som om* och *som är* och är någonting som måste inkludera fantasi och öppenhet där digitala teknologier antingen kan hindra eller bidra till sådan öppenhet

(iv) hur undervisning kan ta form i gemensamma aktiviteter där gemensamma erfarenheter av digitala teknologier kan användas som startpunkt för undervisning.

Resultaten indikerar också att genom att diskutera teoretiska begrepp i fokusgruppsamtal, var det möjligt för deltagarna att distansera sig från (digitala) aktiviteter i deras praktik. I sociokulturella termer kan detta diskuteras i form av utvecklandet av agens genom begrepps medierande roll.

Diskussion

I detta avsnitt diskuteras avhandlingens resultat i relation till forskningsfrågorna och på vilka sätt resultaten är relevanta för forskningsfältet lärares professionella lärande. Avsnittet tar även upp på vilka sätt resultaten kan vara relevanta för de som är intresserade av att arrangera för kompetensutveckling och i förlängningen för lärare i förskolan som möter utmaningar i sin praktik.

Mot bakgrunden av att all utbildning ska vila på vetenskaplig grund (SFS 2010:800) diskuteras resultaten i denna avhandling i relation till hur ett teoretiskt språk kan förstås som ett vetenskapligt förhållningssätt. Det vill säga, resultaten visar hur utvecklandet av ett professionellt teoretiskt språk är viktigt eftersom det är systematiserat och öppnar upp för att kunna analysera och skapa mening av nya observationer. Ett teoretiskt språk är med andra ord inte bara viktigt i vetenskapligt arbete utan även i lärares arbete i sin praktik (Pramling, 2022). Detta blir exempelvis synligt i Artikel II där det blir observerbart hur arbetslagets resonemang om sin roll i lek medieras av vetenskaplig kunskap (lekresponsiv undervisning). Vidare diskuteras resultaten i relation till forskningslitteracitet, vilket innebär att lärare ska kunna tolka och värdera forskning för att kunna avgöra om den är användbar för just deras praktik (Persson, 2017). Resultaten i denna avhandling indikerar att lärares lärande om komplexa frågor tar mycket tid och engagemang (se t.ex. processen av att appropriera begreppet metakommunikation i Artikel 1). I relation till de ökade kvalitetskraven som läggs på lärare (OECD, 2020) kan utvecklandet av forskningslitteracitet därför diskuteras som ett potentiellt dilemma i termer av att lärare inte bara ska vara mottagare av forskning utan också ha tid att lära sig om hur forskning går till.

Avhandlingens resultat går också att diskutera i relation till lärares agens, alltså hur lärare kan utveckla och påverka sin egen profession i motsats till att endast

genomföra politiskt definierade mål. Även om agens inte använts som analytiskt redskap indikerar resultaten i Artikel III att arbetslaget utvecklar agens när de tillsammans vänder sig till en teori, lekresponsiv undervisning, för att ta sig an utmaningen att integrera digitala teknologier i förskolan. Från ett sociokulturellt perspektiv handlar agens om människors förmåga att medvetet förändra sina omständigheter (se t.ex. Vygotskij, 1978). I relation till resultaten i denna avhandling skulle förslag på vidare forskning därför kunna vara att studera hur lärare pratar om förändringar i deras praktik som kan skapa nya förutsättningar för deras lärande. Vidare bekräftar resultaten i denna avhandling tidigare forskning om hur lärares professionella lärande tar lång tid (t.ex. Peleman m.fl., 2019). Det finns dock fog för att fortsätta att synliggöra denna fråga då det finns indikationer på att lärare i förskolan har otillräckligt med tid för reflektion och kompetensutveckling (Skolinspektionen, 2018).

Resultaten i denna avhandling bidrar även med kunskap kring vilka begrepp relaterade till lekresponsiv undervisning som var viktiga ur arbetslagets perspektiv. Detta är ett viktigt kunskapsbidrag eftersom lärarnas perspektiv på begreppen inte studerades i det ursprungliga projekt där lekresponsiv undervisning utvecklades (Pramling m.fl., 2019). Till exempel kan avhandlingen visa att begreppet 'metakommunikation' var centralt för deltagarna i relation till att förstå lek -och undervisningsaktiviteter. Även begreppet 'styra' visade sig vara viktigt att resonera kring för att samtala om lärarens roll i lek. I relation till lekresponsiv undervisning bidrar även avhandlingen med kunskap om hur teorin kan användas för att ta sig an utmaningen att integrera digitala teknologier i förskolan, något som inte har studerats tidigare.

I detta avsnitt lyfts även metodologiska reflektioner. Dessa handlar om hur studerandet av en process snarare än en produkt (se t.ex. Scribner & Cole, 1973; Wallerstedt m.fl., 2022) gjort det möjligt att få syn på, inte bara *att* och *vad* ett arbetslag lär utan också *hur* de lär. Detta är speciellt observerbart i Artikel I och II. Resultaten i Artikel I illustrerar till exempel hur det finns en växelverkan mellan att läsa om begreppet metakommunikation och att uttrycka en egen förståelse för begreppet. Att studera lärprocesser i Artikel II synliggjorde också inte bara *att* arbetslaget förändrade sitt sätt att resonera om sin roll i lek men också *hur* denna förändring skedde. Alltså hur re-mediering av begreppet 'styra' öppnade upp för en förändring i resonemanget om lärarnas roll i lek.

En annan metodologisk reflektion handlar om frågor som rör att kombinera forskning och utveckling. Sammanfattningsvis berör dessa frågor vikten av att reflektera kring om studien går ut på att forska *på* eller *med* lärare, hur mycket

lärarna är involverade i beslut kring design av studien samt vem som analyserar vad i relation till syftet med studien. I denna typ av samarbetsprojekt är det även viktigt att reflektera över det vetenskapliga bidraget och bidraget till utvecklandet av praktiken (Mattson & Kemmis, 2007). I just denna avhandling kan det vetenskapliga bidraget ses i form av artiklar publicerade i vetenskapliga tidskrifter. Bidraget till utvecklandet av praktiken är svårare att dra slutsatser kring då det analytiska fokuset riktats mot lärarnas samtal. Det går dock att urskilja hur deltagarna talar om förändringar i sin praktik. De metodologiska reflektionerna handlar också om hur hållbarhet i praktiknära forskningsprojekt kan förstås i relation till vikten av inte bara hur ett samarbetsprojekt organiseras utan också vilken typ av kulturella redskap som introduceras och hur användbara dessa är för lärarna.

En annan reflektion i detta avsnitt gäller användningen av begreppet re-mediering som använts främst i Artikel II. Re-mediering är ett begrepp som diskuterats teoretiskt (t.ex. Cole & Griffin, 1986) och som använts analytiskt på olika sätt (Nilsen m.fl., 2022; Nuttall m.fl., 2019). I denna avhandling diskuteras potentialen i att använda re-mediering genom diskursiva redskap för att analysera förändringsprocesser.

Resultaten i denna avhandling bidrar avslutningsvis med implikationer för kompetensutvecklingsinsatser i förskolan. Dessa handlar om att låta professionell utveckling ta tid, göra det möjligt att diskutera teoretiska begrepp, använda forskningslitteratur inte bara innan samtal utan också under samtalets gång och slutligen att tillsammans analysera video-sekvenser av lärares deltagande i aktiviteter i förskolan.

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Appendices

Appendix 1. Informed consent document to caregivers in first datagenerating

Till vårdnadshavare

Hej,

Jag heter Emelie Stavholm och jag är förskollärare och doktorand inom forskarskolan ReCEC på Göteborgs universitet där jag nu arbetar med min licentiatuppsats. Ert/era barn(s) förskola är med i ett nätverk för samverkan mellan förskola och högskola/universitet med fokus på att sprida kunskap kring hur man kan utmana och stötta barn i förskolan att utveckla sin förståelse för omvärlden och sig själva på ett sätt som inte utesluter utan istället på olika sätt bygger på och förhåller sig till barns lek.

Jag planerar att genomföra en studie i relation till nätverket genom att ta reda på hur lärare samtalar kring lek och undervisning. Lärarna kommer först att få läsa texter kring begreppet lekresponsiv undervisning och jag kommer sedan att filma lärarna när de i förskolans utbildning arbetar med begreppet. Lärarnas samtal kommer med andra ord att utgå från videoinspelningar. Även om era barn inte kommer att vara fokus för denna studie så kan det hända att de är med i filmerna. Jag planerar även att fortsätta min forskning genom att skriva en doktorsavhandling där det finns en möjlighet att barnen i filmerna blir fokus för studien.

Allt deltagande är frivilligt och deltagarna har rätt att avbryta sin medverkan när de så önskar. För att kunna filma barnen på förskolan behöver jag tillåtelse från varje barns vårdnadshavare. Jag ber er därför fylla i talongen nedan och återlämna denna till någon av pedagogerna på avdelningen så snart som möjligt men senast den 1/7-2019. Filmerna kommer endast att användas för forskande ändamål, samt om ni också ger denna andra tillåtelse, i undervisningssituationer så som utbildning av lärare och presentationer på konferenser. Materialet kommer inte att vara tillgängligt för obehöriga. När denna forskning publiceras kommer alla barn, lärare liksom skolan ges fingerade namn. Självklart kommer jag att ta hänsyn till om barnet själv visar att hon eller han inte vill bli filmad. Studien finansieras av Göteborgs stad. Har ni några frågor är ni välkomna att höra av er till mig (enligt kontaktinformation nedan).

Vänliga hälsningar,
Emelie Stavholm

Kontaktpersoner vid frågor eller funderingar:
Doktorand: Emelie Stavholm
emelie.stavholm@gu.se
Handledare: Cecilia Wallerstedt

cecilia.wallerstedt@gu.se
Handledare: Pernilla Lagerlöf
pernilla.lagerlof@gu.se

....

☐   Ja, jag ger tillåtelse att mitt/mina barn får delta i studien genom att videofilmas

☐   Jag ger **också** tillåtelse till att videofilmer får användas i undervisning och konferenspresentationer

☐   Nej, mitt/mina barn får inte videofilmas

Barnets namn ………

Målsmans (1) underskrift ……….

Målsmans (2) underskrift ……..

Namnförtydligande ……

Datum …….

Appendix 2. Informed consent document to teachers in first data generating

Till lärare

Hej,

Jag heter Emelie Stavholm och jag är förskollärare och doktorand inom forskarskolan ReCEC på Göteborgs universitet där jag nu arbetar med min licentiatuppsats.

Jag planerar att genomföra en studie i relation till nätverket "Lekbaserad förskoledidaktik: att vidareutveckla förskoledidaktisk teoribildning mellan forskare och förskollärare" som har resulterat i Lekresponsiv undervisning. Studien går ut på att ta reda på hur lärare samtalar kring lek och undervisning. Deltagarna (lärarna) kommer först att få läsa texter kring begreppet lekresponsiv undervisning och jag kommer sedan att videofilma lärarna när de i förskolans utbildning arbetar med begreppet. Analysen för studien utgår från ljudinspelade fokusgruppsamtal där lärarna resonerar kring lek och undervisning med utgångspunkt ur videosekvenser från praktiken. Inom denna studie kommer videofilmerna från praktiken alltså *inte* att analyseras. Däremot kommer, med din tillåtelse, videofilmerna att eventuellt analyseras inom ramen för en framtida doktorsavhandling. Den aktuella studien kommer med andra ord att bestå av analyser av de ljudinspelade fokusgruppsamtalen.

Allt deltagande är frivilligt och deltagarna har rätt att avbryta sin medverkan när de så önskar. För att kunna filma dig både i utbildningen och under fokusgruppsamtalet behöver jag din tillåtelse. Jag ber dig därför fylla i talongen nedan och återlämna till din chef så snart som möjligt men senast den 1/7-2019. Filmerna kommer endast att användas för forskande ändamål, samt om du också ger denna andra tillåtelse, i undervisningssituationer så som utbildning av lärare och presentationer på konferenser. Materialet kommer inte att vara tillgängligt för obehöriga. När denna forskning publiceras kommer alla barn, lärare liksom skolan ges fingerade namn. Studien finansieras av Göteborgs stad. Har ni några frågor är ni välkomna att höra av er till mig (enligt kontaktinformation nedan).

Vänliga hälsningar,
Emelie Stavholm

Kontaktpersoner vid frågor eller funderingar:
Doktorand: Emelie Stavholm (emelie.stavholm@gu.se)
Handledare: Cecilia Wallerstedt (cecilia.wallerstedt@gu.se)
Handledare: Pernilla Lagerlöf (pernilla.lagerlof@gu.se)
……..

☐ Ja, jag deltar i studien genom att videofilmas i utbildningen och genom att delta i fokusgruppsamtal som spelas in med ljudupptagare.

☐ Jag ger **också** tillåtelse till att videofilmer får användas i undervisning och konferenspresentationer

Underskrift ……………………………………………………………………………………………………..

Namnförtydligande …………………………………………………………………………………………….

Datum …….

Appendix 3. Informed consent document to caregivers in second datagenerating

GÖTEBORGS UNIVERSITET

TILL VÅRDNADSHAVARE   Datum

INFORMATION OM DELTAGANDE I STUDIE

Lek och undervisning i förskolan på vetenskaplig grund: Ett arbetslags gemensamma lärprocess

Information om forskningsintresse och metoder

Hej,
Jag heter Emelie Stavholm och jag är doktorand inom forskarskolan PRECEC (Utbildning för lekresponsiv undervisning i förskolan för social och kulturell hållbarhet) på Göteborgs universitet. Inom min forskarutbildning ska jag genomföra en studie och ert barns förskola har visat intresse av att delta i denna studie.

Under 2019 kom jag i kontakt med personalen på ert barns förskola och vi genomförde tillsammans ett utvecklings- och forskningsprojekt kring lek och undervisning. Personalen har genom läroplanen för förskolan uppdraget att såväl främja barnens lek som att undervisa dem, och att kombinera dessa uppdrag har enligt forskning visat sig vara en utmaning för förskollärare. Vi träffades under 8 månader och läste texter om ny forskning kring hur man kan undervisa i förskolan på ett sätt som är responsivt på barns lek. Jag var också med i verksamheten och filmade tillfällen när barnen och lärarna lekte tillsammans. Dessa filmer använde vi som underlag för reflektion i våra samtal. Det min forskning handlar om är lärarnas lärande, det vill säga hur de utvecklar sitt kunnande om lek och undervisning genom att läsa, diskutera och reflektera.

Vi har nu planerat en fortsättning på projektet som kommer att ha samma upplägg som det tidigare, alltså att lärare samtalar kring lek och undervisning, men denna gång med ett riktat fokus mot barns digitala erfarenheter i lek (både erfarenheter av artefakter som tex lärplattor men också lekar där barnen hämtar inspiration från tv, film och andra media). Lärarna kommer alltså att delta i fokusgruppsamtal som utgår från videoinspelningar från verksamheten. Det innebär att lärarna kommer att filma sig själva när de deltar i barns lek. I fokusgruppsamtalen kommer vi att titta på dessa filmer tillsammans och ha som utgångspunkt för diskussion. Samtalen kommer att spelas in digitalt på Zoom. Fokus i denna forskning är alltså lärarnas lärande, men barnen blir deltagare i studien eftersom de är med i verksamheten. Filmerna och zoom-samtalen kommer inte att visas för någon obehörig. I de utskrifter som görs kommer barnens eller förskolans namn inte att nämnas, ej heller annan information som kan röja barnens identitet.

Om ni ger tillåtelse kan videofilmerna komma att användas även i fler studier.

Användning och förvaring av forskningsmaterialet samt publicering av resultat (GDPR)

Videomaterialet lagras i minst tio år på Göteborgs universitets krypterade lagringsplats för forskningsdata, vilken ingen obehörig kan få ta del av. Detta sker i enlighet med existerande regelverk för förvaring och lagring av forskningsmaterial. Pseudonymiserade transkriptioner kommer att sparas på Göteborgs universitets interna lagringsplats och är tillgängliga för de medverkande forskarna, vilket i detta fall är mig och mina två handledare. Ljud - och videoinspelningar räknas som personuppgifter. Ansvarig för deltagarnas personuppgifter är Göteborgs universitet. Göteborgs universitet har ett dataskyddsombud som du kan nå via e-post: dataskydd@gu.se, eller telefon: 031-786 00 00. Studien följer riktlinjer enligt GDPR (https://www.datainspektionen.se/lagar--regler/dataskyddsforordningen/).

Resultaten av studien kommer att publiceras i artikelform i eventuellt både nationella och internationella vetenskapliga tidskrifter, i mitt avhandlingsarbete, och kan användas i undervisning och vid presentationer vid forskningskonferenser. När forskningen publiceras kommer som sagt alla barn, lärare liksom förskolan, ges fingerade namn. Ibland kan det, i presentation av forskningen, vara av vikt att visa till exempel vilka gester deltagarna gör när de kommunicerar. Om detta behöver visas med en bild så används programvara som stiliserar deltagarna.

Frivillig medverkan och avbrytande av samtycke

För att genomföra studien måste vi ha ert samtycke vilket tillåter oss att dokumentera leksituationer som barnen och läraren deltar i. Om ni som vårdnadshavare samtycker till ert barns deltagande, ber vi er att underteckna följande blankett och återlämna den till någon av pedagogerna på avdelningen så snart som möjligt. Deltagande i projektet är frivilligt och forskningspersoner (dvs. medverkande i studien) har rätt att när som helst avbryta sin medverkan utan att skäl behöver anges. Detta gäller vårdnadshavare, barn och personal i förskolan. Om deltagare väljer att avbryta sin medverkan kommer de inte att ingå i några ytterligare aktiviteter som studeras. Därmed följer studien de etiska riktlinjer som arbetats fram av the European Early Childhood Education Research Association (EECERA, 2016), och svensk lag (2003:460) om etikprövning av forskning som avser.

Information om medverkande forskare

Göteborgs universitet är forskningshuvudman. Studien genomförs av **Doktorand Emelie Stavholm** (emelie.stavholm@gu.se, 0739-529963) i samarbete med **Docent Cecilia Wallerstedt** (cecilia.wallerstedt@gu.se) som är huvudansvarig forskare och handledare i doktorandprojektet, och **Universitetslektor Pernilla Lagerlöf** (pernilla.lagerlof@gu.se) som är biträdande handledare.

Vid frågor kontakta gärna någon av forskarna, huvudsakligen Emelie Stavholm.

TILL VÅRDNADSHAVARE

SAMTYCKESBLANKETT – DELTAGANDE I STUDIE

Deltagande i studien är frivilligt och forskningspersoner har rätt att när som helst avbryta sin medverkan.

Resultaten av studien kommer att publiceras i artikelform i eventuellt både nationella och internationella vetenskapliga tidskrifter, i Emelie Stavholms avhandlingsarbete, och vid aktiviteter för undervisnings– och skolutveckling (t.ex. vid forskningskonferenser).

Deltagarna får ingen betalning.

☐   Ja, jag ger härmed mitt samtycke till mitt barns deltagande i studien. Jag har fått   information om deltagande i studien, att jag och mitt barn får återkalla samtycket och vad det innebär. Jag har även fått information om GDPR.

(Vänligen kryssa i rutan.)

OBS! Om barnet har två vårdnadshavare måste båda skriva under denna blankett.

Barnets namn:_____

Vårdnadshavare 1 underskrift:_____

Namnförtydligande:_____

Vårdnadshavare 2 underskrift:_____

Namnförtydligande:_____

Ort och datum:_____

Appendix 4. Informed consent document to teachers in second data generating

GÖTEBORGS UNIVERSITET

TILL PERSONAL   Datum

INFORMATION OM DELTAGANDE I STUDIE

Lek och undervisning i förskolan på vetenskaplig grund: Ett arbetslags gemensamma lärprocess

Information om forskningsintresse och metoder

Hej,
Jag heter Emelie Stavholm och jag är doktorand inom forskarskolan PRECEC (Utbildning för lekresponsiv undervisning i förskolan för social och kulturell hållbarhet) på Göteborgs universitet. Inom min forskarutbildning ska jag genomföra en studie och er förskola har visat intresse av att delta i denna studie.

Under 2019 kom jag i kontakt med er och vi genomförde tillsammans ett utvecklings- och forskningsprojekt kring lek och undervisning. Lärare i förskolan har genom läroplanen för förskolan uppdraget att såväl främja barnens lek som att undervisa dem, och att kombinera dessa uppdrag har enligt forskning visat sig vara en utmaning för förskollärare. Vi träffades under 8 månader och läste texter om ny forskning kring hur man kan undervisa i förskolan på ett sätt som är responsivt på barns lek. Jag var också med i verksamheten och filmade tillfällen när barnen och lärarna lekte tillsammans. Dessa filmer använde vi som underlag för reflektion i våra samtal. Det min forskning handlar om är lärarnas lärande, det vill säga hur de utvecklar sitt kunnande om lek och undervisning genom att läsa, diskutera och reflektera.

En fortsättning på projektet är nu planerad som kommer att ha samma upplägg som det tidigare, alltså att lärare samtalar kring lek och undervisning, men denna gång med ett riktat fokus mot barns digitala erfarenheter i lek (både erfarenheter av artefakter som tex lärplattor men också lekar där barnen hämtar inspiration från tv, film och andra media). Ni kommer alltså att delta i fokusgruppsamtal som utgår från videoinspelningar från verksamheten. Det innebär att ni som arbetslag kommer att delta i ca tre fokusgruppsamtal digitalt på Zoom tillsammans med mig. I dessa samtal kommer vi att prata om lek, undervisning och barns digitala erfarenheter. Inför samtalen kommer ni att läsa texter om barns digitala erfarenheter samt filma er själva när ni deltar i barns lek. I samtalen kommer vi att titta på filmerna tillsammans. Fokus i denna forskning är alltså lärarnas lärande, men barnen blir deltagare i studien eftersom de är med i verksamheten. Filmerna och zoom-samtalen kommer inte att visas för någon obehörig. I de utskrifter som görs kommer barnens eller förskolans namn inte att nämnas, ej heller annan information som kan röja barnens eller lärarnas identitet.

Om ni ger tillåtelse kan videofilmerna och ljudupptagningarna komma att användas även i fler studier.

Användning och förvaring av forskningsmaterialet samt publicering av resultat (GDPR)

Ljud – och videoinspelningar lagras i minst tio år på Göteborgs universitets krypterade lagringsplats för forskningsdata, där ingen obehörig kommer att få ta del av materialet. Detta sker i enlighet med existerande regelverk för förvaring och lagring av forskningsmaterial. Pseudonymiserade transkriptioner kommer att sparas på Göteborgs universitets interna lagringsplats och är tillgängliga för de medverkande forskarna, vilket i detta fall är mig och mina två handledare. Ljud - och videoinspelningar räknas som personuppgifter. Ansvarig för dina personuppgifter är Göteborgs universitet. Göteborgs universitet har ett dataskyddsombud som du kan nå via e-post: dataskydd@gu.se, eller telefon: 031-786 00 00. Studien följer riktlinjer enligt GDPR (https://www.datainspektionen.se/lagar--regler/dataskyddsforordningen/).

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Frivillig medverkan och avbrytande av samtycke

För att genomföra studien måste vi ha ditt samtycke.

Deltagande i projektet är frivilligt och forskningspersoner (dvs medverkande i studien) har rätt att när som helst avbryta sin medverkan utan att skäl behöver anges. Detta gäller vårdnadshavare, barn och personal i förskolan. Om deltagare väljer att avbryta sin medverkan kommer de inte att ingå i några ytterligare aktiviteter som studeras. Därmed följer studien de etiska riktlinjer i svensk lag (2003:460) om etikprövning av forskning som avser människor

Information om medverkande forskare

Göteborgs universitet är forskningshuvudman. Studien genomförs av **Doktorand Emelie Stavholm** (emelie.stavholm@gu.se, 0739-529963) i samarbete med **Docent Cecilia Wallerstedt** (cecilia.wallerstedt@gu.se) som är huvudansvarig forskare och handledare i doktorandprojektet, och **Universitetslektor Pernilla Lagerlöf** (pernilla.lagerlof@gu.se) som är biträdande handledare.

Vid frågor kontakta gärna någon av forskarna, huvudsakligen Emelie Stavholm.

TILL PERSONAL

SAMTYCKESBLANKETT – DELTAGANDE I STUDIE

Deltagande i studien är frivilligt och forskningspersoner har rätt att när som helst avbryta sin medverkan.

Resultaten av studien kommer att publiceras i artikelform i eventuellt både nationella och internationella tidskrifter, i Emelie Stavholms avhandlingsarbete och vid aktiviteter för undervisnings – och skolutveckling (t.ex. vid forskningskonferenser).

Deltagarna får ingen betalning.

☐   Ja, jag ger härmed mitt samtycke till mitt deltagande i studien. Jag har fått informationen om deltagande i studien, att jag får återkalla mitt samtycke och vad det innebär. Jag har även fått information om GDPR.

(Vänligen kryssa i rutan.)

Underskrift:_____

Namnförtydligande:_____

Ort och datum:_____

Appendix 5. First data generating time frame

First Data Generating			
FT19-ST20 Week	**Activity**	**Content**	**Data**
32	The semester at the preschool starts	The participants read two articles on PRECEC (the texts were given personally to the participants at the end of previous semester in July (ST19)	
35	Pre-visit with video-camera	I brought the video-camera to the preschool to create a possibility for the children and preschool staff to get familiarized with it.	
	Planning meeting		
	FGC 1	Together with the participants decided that if more than one participant is absent, the time for the focus group conversation (FGC) would be rescheduled. Information was provided to the participants regarding that the conversations are planned to take one hour and that each conversation will include a decision by the participants on what to video-record.	Notes
		Audio-recorded FGC regarding the 2 articles where we discussed: what was difficult? What was interesting? Is there anything they would like to try in practice that we can video-record? What activity? When? For how long?	1 hour audio
36	Video-recording	Based on the interest of the participants, two of the teachers were video-recorded during a spontaneous play situation indoors with focus on how and in what extent they respond to the children's intentions as well as if/how they control the outcome of the play.	53 min. video
37	On-line lecture	Three of the participants (Daniela, Sofia and Katarina) saw an on-line lecture on PRECEC.	
40	FGC 2	Audio-recorded FGC based on sequences of the video-recordings as well as the participants questions (how and in what extent they respond to the children's intentions as well as if/how they control the outcome of the play?) from FGC 1. I planned to show a video-sequence from a Birthday party-play, but it didn't work, so I changed to a Train-play.	I hour audio
42	Video-recording	Video-recordings based on FGC 1; an outdoor play situation with focus on how the teachers manage to direct the children's attention and challenge their comprehension of a content in relation to the children's intentions in the play. For the second filming, the teachers planned a playful activity with water outside in the new	18 min. video

		yard. Since the yard was not finished, they changed the activity to Sleeping Bear. They asked, through text messaging, if it was ok and I wrote yes but encouraged them to keep a learning content in mind while performing the activity.	
43	Lecture at Gothenburg university	Two of the participants (Sofia and Katarina) attended a lecture on PRECEC.	
45	FGC 3	Audio-recorded FGC based on sequences of the previous video-recordings as well as the participants question from FGC 2 (how does the teachers manage to direct the children's attention and challenge their comprehension of a content in relation to the children's intentions in the play?). We watched video-sequences of a Birthday party-play and of playing Sleeping Bear.	1 hour audio
46	Video-recording	Video-recordings indoors, in the morning, during spontaneous play in accordance with teachers wish to record how they metacommunicate in play activities.	50 min. video
	Reading of an extra article	After FGC 3 and the video-recordings, the participants read one extra article related to Play-responsive Teaching with a focus on metacommunication.	
48	FGC 4	Audio-recorded FGC based on sequences of the previous video-recordings as well as the participants question from FGC 3 (how do the teachers metacommunicate in play and teaching activities?).	1 hour audio
49	Video-recording	Since the participants had read one extra article related to metacommunication after they participated in play activities with focus on how they metacommunicate, it was decided that with the new knowledge from the read article, that they for this video-recording session would again focus on how they metacommunicate in play. The recordings took place indoors, in the morning during spontaneous play activities.	73 min. video
2	FGC 5	Audio-recorded FGC based on sequences of the previous video-recordings as well as the participants question from FGC 4 (how do the teachers metacommunicate in play and teaching activities?).	1 hour audio
4	Video-recording	Video-recordings indoors, in the morning, during spontaneous play in accordance with teachers wish to record how they metacommunicate in play activities.	70 min. video
6	FGC 6	Audio-recorded FGC based on sequences of the previous video-recordings as well as the participants question from FGC 5 (What happens when the teachers try to focus on a learning content (e.g. mathematics, literacy etc. in play?)	1 hour audio
			Total audio: 6 hours Total video: 264 min

Appendix 6. Second data generating time frame

	Second Data Generating		
FT20-ST21 Week	**Activity**	**Content**	**Data**
41	Planning meeting on Zoom	We first planned to start the project in October but due to waiting for approval from the Ethical Review Board and one participant on sick leave, we decided to postpone the project until ST21.	Notes (This meeting is not recorded as informed consent documents had not been collected yet).
49-52	Reading research literature	The participants read one chapter in Nilsen (2020) regarding digital media and play. They also watched an on-line lecture by the same author regarding digital media in ECEC.	
11	Planning meeting on Zoom	During this meeting it was decided that we will conduct three FGCs on Zoom due to the situation related to the COVID-19 pandemic. For the same reason, it was decided that the teachers will video-record themselves in between the FGCs. Decides that until we meet again they will think about something that they would like to explore further in their work that relates to digital media and Play-Responsive Teaching. We also decide that FGC 1 will depart from chapter 9 in Nilsen (2020).	Notes (This meeting is not recorded as informed consent documents have not been collected yet).
12	FGC 1	Zoom-recorded FGC based on chapter 9 in Nilsen (2020). The participants decide that they want to try an application on an IPad relating to playing "shop" together with the children in order to explore how to be responsive to children's intentions in play when adding a digital tool.	Zoom-recording: 50 min
13-15	Video-recordings	The participants video-recorded themselves in play activities with children. During FGC 1, it was decided to try an application relating to playing "shop", but the participants instead used a webpage for shopping on-line. After FGC 1, the participants also decided to try two applications (Bollibompa and Radioapan) with the purpose of moving from the activity with the application to analogue play.	Video: 52 min
15	FGC 2	Zoom-recorded FGC based on sequences of the previous video-recordings as well as the participants' interest in discussing moving from an activity with digital technology to an analogue play activity.	Zoom-recording:1 hour and 20 min.

		We decide to read chapter 6 and 7 in Nilsen (2020) in addition to listening to one podcast episode with the same author regarding digital media in preschool. We also decide that the participants video-record themselves in play activities with digital media of their choosing after reading the chapters and listening to the podcast episode.	
15-18	Video-recordings	The participants video-record themselves in play activities with digital media of their choosing after reading the new chapters and listening to the podcast episode (only one of the participants had listened to the episode).	Video: 106 min
18	FGC 3	Zoom-recorded FGC based on sequences of the previous video-recordings. Based on the wishes of the participants, a fourth FGC is added. It was decided that before FGC 4, the participants would watch a children's program together and then plan an activity with the help of the concepts indirect and direct support as well as to video-record this activity.	Zoom-recording:1 hour
	Video-recordings	The participants video-record themselves in a planned play activity based on an episode of Bamse which the children and the teachers had watched together.	Video: 27 min
22	FGC 4	Zoom-recorded FGC based on sequences of the previous video-recordings as well as the participants' interest in discussing how to be responsive to children's digital experiences in play by departing from a children's program.	Zoom-recording: 1 hour
			Total Zoom-recordings: 4 hours and 20 minutes Total video: 185 min

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This thesis focuses on teacher professional learning by exploring how a work team in preschool collectively learn about contemporary challenges in early childhood education and care (ECEC), by means of a didactical theory, PRECEC (Pramling et al., 2019). These challenges include understanding the relationship between play and teaching in addition to how to understand the role of digital media in preschool. The thesis is based on a combined research and development project where a work team in preschool were introduced to PRECEC. The work team discussed readings about PRECEC alongside watching video-recorded sequences of themselves participating in play activities with children. A sociocultural perspective has been used when studying the work teams' learning processes in focus group conversations. Many studies within the field of teacher professional learning have focused on the effect of professional development effort. This thesis contributes with knowledge regarding the processes by which a work team learn, more specifically, new knowledge regarding how an ECEC work team learn about contemporary challenges by means of PRECEC. This thesis is therefore useful for anyone interested in organizing for professional development efforts in ECEC.

Emelie Stavholm has a background as a preschool teacher. Her research interest concerns teacher professional learning in early childhood education and care settings.