How Early Childhood Practitioners Build, Shape, and Construct Their Digital Practices: The Search for an Analytical Space

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English abstract

This ongoing research examines how early childhood practitioners build, shape, and maintain digital practices through talk and action, assuming shared construction and development of knowledge. Based on empirical data I suggest looking beyond the social situated idea of knowledge building to include multiple elements, like individual knowledge, discourse and materiality, in analyses of the digital practice field in kindergarten. The discussions are both theoretically and empirically driven and tend to create a dynamic context model as a representation of the digital practice field.

Keywords: materiality, discourse, knowledge, digital practice, Early Childhood Education
Introduction

Over the past few decades, the digitization of society has influenced both childhood and professional practitioners who work in kindergarten. In the last few years, digital tools have begun to appear in professional day-care practices (Bølgan, 2009; Kvinge et al., 2010). Early childhood education in Norway has not yet made any formal statements regarding the use of ICT in kindergarten, in contrast to the education of children ages six to sixteen, for whom digital literacy has become the fifth core competence in school (Norwegian Ministry of Education and Research, 2006). Regarding kindergarten, the framework plan states: “Children should have the opportunity to experience how digital tools can be used for play, communication and the gathering of information” (Norwegian Ministry of Education and Research, 2011). By using the word “should”,¹ the plan implies that the use of digital tools is a choice, and leaves it up to the kindergarten and local municipality to decide to what extent digital tools are a part of the content. Norwegian kindergartens differ a great deal, both in the kinds of digital tools they have access to and in their use of these tools (Bølgan, 2009; Kvinge et al., 2010). In this study, I address all technologies that appear in social relations in kindergarten in the term “digital tools”. This term does mean different things to different groups of early childhood practitioners, and the technologies to which it refers vary from scanners and printers to iPads and touch screens. Like Plowman and Stephen (2007), I argue that we still need to explore what ICT in early years’ education might be. In this light, I intend to include a wide range of items in my application of the concept “digital tool” in order to look into digital practice as it occurs in kindergarten.

A survey on the use and experiences of digital tools amongst children ages zero to six in Norway show that 65 percent of children have used computers and 60 percent have experienced the use of touch screens at home before they reach the age of six (Gudmundsdottir & Hardersen, 2012). The framework plan points in the direction that the competencies and experiences children bring with them into kindergarten should be considered in developing kindergarten content. Yelland (2006) establishes that children are exposed to a range of new technologies in their lives. Thus, they have to be able to choose to use technology for their daily activities if they want to (Yelland, 2006, p. 226).

Therefore, it is reasonable to assume that professional practitioners in kindergarten have to consider and discuss how children’s digital experiences and the growing use of digital tools will affect professional content in kindergarten. The notion of digital practice is complex, and it is not enough to look at it as a set of social actions. Building on Kemmis and Smith (2008), I understand “digital practice” as referring to actions enacted by early childhood practitioners that demand in-the-moment decisions regarding moral, ethical, and tradition-oriented dilemmas. To narrow the concept of digital practice, I examine episodes that involve digital tools in which both adults and children are present. There is little research done on how practitioners in early childhood education develop digital practice. Of the work that has been done, the majority of earlier studies on professionals’ use of ICT in education² reveal that teachers and preschool teachers are insecure in various ways about how to use digital tools with children (Arnseth, Hatlevik, Klovstad, Kristiansen, & Ottestad, 2007; Plowman, Stephen, & McPake, 2010; Yelland, 2006). Other studies point to lack of time and little access to technology as reasons for why professionals do not participate in professional development in terms of digital tools (Olofsson, Lindberg, Fransson, & Hauge, 2011).

In this paper, I identify contextual representations that are crucial to the development of the field of digital practice in kindergartens today. Individual knowledge, discourse, and materiality will be
suggested as both vital contextual factors and as lenses through which to gain new perspectives on digital practice.

Methodology

Drawing upon ongoing ethnographically inspired fieldwork in two Norwegian kindergartens, this study examines digital practice among early childhood practitioners. I use the term “ethnographically inspired” because, as a researcher, I view ethnography not as a particular method of data collection, but more as a distinctive style of research that is aimed at understanding the social meanings and activities of people in a given “field” (Brever, 2000, p. 11). The “field” in which I spend my time during my fieldwork includes two Norwegian kindergartens with children aged three to six years.

The main interest of the project is to look into digital practice as carried out by early childhood practitioners, by examining activities in which they use digital tools together with the children. The focus is on the practitioners and how they develop their digital practices through their work in kindergarten. In the first weeks of my fieldwork, I observed and talked with the participants, and I was also a participant. With informal talks in particular, there are several ethical aspects to consider. The sayings were written down after the conversation, and the participants were perhaps not aware that I, as a researcher, was planning on using their sayings in future analyses and readings. The participants were therefore given access to the written material so they could proofread the transcriptions.

Analyses are done as thematic analyses in two phases. First, the material is organized thematically and headings are given in an aim to describe each theme. Second, the material is put into a theoretical framework as a way to discuss and understand the themes (Hammersley & Atkinson, 2007). As a picture of digital practice, I have chosen a learning cycle as the site of analysis.

Learning as socially situated

Digital practice is understood as processes of socialization in which building and expanding knowledge are embedded. Thus, digital practice also has to do with professional learning amongst early childhood practitioners. Metaphors of learning (Sfard, 1998) are constructed to highlight certain attitudes and approaches towards learning. They do not all have to be present in every actual case; instead, they function more as an ideal type in a schematic, simplified way (Paavola & Hakkarinen, 2005).

Building on Yelland (2008), I aim to rethink learning in early childhood education based on the changed position of the adult, from someone who knows most answers to an adult who functions as a co-construct of meaning alongside other participants. The position of the participants changes according to what different individuals bring with them into the dialogue and the actions they perform together. In this understanding, all of the participants in digital practice are both fully learners and fully teachers. This opens the door for experimentation and exploration in the field. The learning cycle, shown in Figure 1, functions as a picture of how the participants in the same community can work to share and develop knowledge and practice.
This idea of learning and developing knowledge is socially oriented and functions as a starting point for the discussions to follow. By positioning practice as the actions that people do together, both intentionally and unintentionally, practice becomes situated in social networks. This is close to the understanding that Schatzki (2006) presents of practice, i.e., as work-related doings and sayings made up of both structure and action, and organized around shared understandings. The workplace, in this case the kindergarten, is a site of learning. The participants not only remake earlier understandings and doings in their practices, but they also develop new knowledge through their intertwined collaboration with both structures and actions.

In all practices, there are aspects that go beyond the participants and their actions, “…they are also shaped and conditioned by arrangements, circumstances and conditions beyond each person as an individual agent or actor” (Kemmis & Grootenboer, 2008, p. 37). In this understanding, practice depends on the experience, intentions, and actions of individuals. In addition, practice is also shaped by conditions beyond each person, and individuality appears in relation to others, which underlies the fact that we are social beings who constitute and are constituted by society: “We become part of shared practices and activities through which our lives are constituted, through our ‘doings’” (Kemmis & Grootenboer, 2008, p. 39). This practice architecture builds on Aristotle’s Ethics and the perspective of the actor, the virtuous person aiming to do what is good for humankind as a part of productive life in society. Participants in social groups are seen as agents, with agency held as a contract between the individual and the society. By virtue of their agency, individuals are entitled to control how, and to what degree, they are governed. This way, individual agents create and re-

**Figure 1.** Learning cycle for developing knowledge and practice through knowledge building and action (Yelland 2008).
create the society by acting and making choices. Individuals are both conscious and not conscious about the reasons and structures that influence their actions (Giddens, 1984). In their organization, these structures within a contextual space govern what actions it is possible to perform.

**Discourse, context and materiality**

Individuals understand social settings not only as individuals, but also as participants of a group. The context surrounding the group is a complex fusion of social and material dimensions that make it possible to perform actions and speech. Van Dijk (2009) discusses how context can be reintroduced in social science as a meaningful part of research. Grounded on the notion that context refers to the social situation and is a part of the non-verbal, social, and situational aspects of communicative events, he limits context to what is relevant to discourse. Discourse is, in this sense, understood as structures that give individuals possibilities and restrictions regarding sayings, thinkings, and doings in specific parts of our lives (Foucault, 1999). The linguistic turn in social science has established language as a system that “constitutes” reality, rather than reflecting reality “as it is” (Alvesson & Kärreman, 2000). Through constructions of what are “good”, “bad”, and, thus, ideal practices, discourses construct our social doings as well as our social sayings (Fairclough, 2007; Foucault, 1999). Language, understood as a site that can be broken into “[bodies] or [corpuses] of statements and utterances governed by rules and conventions of which the user is largely unconscious” (Macey, 2000, p. 100), has been used as an entrance to social practice. Both actions and agency are governed by rules and conventions, though individuals themselves are not conscious of all of them.

Through the addition of the ideas about discourse to our understanding of context, van Dijk takes a theoretical decision and claims that contexts are not “objective”, but “subjective”. Hence, “context” is what is seen to be relevant in the social situation of the participants themselves. At the same time, van Dijk (2009, p. 47) notes that context models must be relatively simple and enable continual update. Following this, the contextual space has to build on elements the practitioners see as important in carrying out their digital practices. These elements might be in line with a larger context, such as the national context, but there are no obvious links between global and local discourses. The challenge in both the linguistic approach and the context presented by van Dijk (2009) is evident when we relate these to materiality. Digital tools work as agents in organizational structures and enter as a part of the dialogue between users. LaTour (1993) expressed this in an ontological view: nature and culture are one, and we need to overcome the erroneous notion that the world is constructed solely of words.

The idea of explaining entities and reality as agentic is not new. In the 1960s, McLuhan (1964) wrote, “the medium is the message” (p. 7). Accordingly, he presented the medium as technology, but also suggested that all human inventions and innovations could play this role. In this way, the computer, the iPad, or the digital camera can be said to be agentic. They themselves discipline the way we can use them. This requires a different idea about learning. Here, I will introduce posthuman ideas as a way to disturb the idea of learning as processes of socialization.

*The posthuman space is a space in which the human actors are still there, but now inextricably entangled with the non-human, no longer at the center of the actions and calling the shots. The world makes us in one and the same process in which we made the world.* (Pickering, 1995, p. 26)

Pickering disturbs the idea of humans as the centre of actions and shows how digital tools are entangled with human agency. Latour (1999) argued for the extension of speech when he revealed
that both humans and nonhumans act: both are capable of formulating propositions. These thoughts might be linked to Foucault’s writings on reality. Hekman (2010, p. 58) claims that Foucault operated with ontology as something other than a fixed, given reality. “What we are”, whether it is as individuals or groups, is the product of both history, discourse, bodies, and nature (Hekman, 2010, p. 58). In this way, materiality affects constructions of practices. It is no longer human interactions or the linguistic or discursive constructions that constitute the centre of interest. Materiality, language, and practitioners work together in a horizontal intra-action (Barad, 2008; Lenz Taguchi, 2010).

Understanding digital practice as socially constructed

To exemplify, I present an episode from the thematic category adult asking another adult for help. This category includes episodes in which adults cooperate and offer or ask for help related to digital tools or practices.

Episode no. 1:

Violet, one of the early childhood practitioners, enters the room. Three of the children immediately run toward her. “Violet! Can you please come help Nicole!” They grab her arm and pull her over to the table. Nicole, the preschool teacher, is sitting at the table with the laptop in front of her. Nicole is transferring pictures from the camera onto the computer via a cable. Somehow the operation has crashed, and she is not pushing any of the buttons. “In case I lose all of the pictures, you know,” she says, glancing at Violet. Violet takes a seat next to her and looks at the screen. “Hmm,” she says. “Normally, the computer asks you if you are sure, so there is probably no risk of losing them, but sometimes the memory card is not that easy to read when it is placed in the camera.” One of the children asks, “So why don’t we just take it out?” Nicole looks surprised. “Can we do that?” Violet shows Nicole and the children how to remove the card from the camera. She gives the card to one of the children and lets her figure out where it fits. At the same time as the child reveals where to put the memory card, a girl and her mother arrive. Nicole leaves the table, and says: “You do it. You are better than me. I will go say hello to Anna.”

In this episode, the children turn to Violet for help. Violet chooses to give room for thoughts by wondering out loud in front of both another adult and the children. Instead of giving away the right answer, she lets the participants figure out together what to do, and at the same time, she gives them enough information to complete their task.

This episode illustrates a work-related action based on a shared understanding of the content: transferring pictures from the camera onto the computer. However, the practice can be understood as more than an activity. As pointed out by Schatzki (2006), an activity involves complex bundles of doings and sayings that change over time, and these changes involve learning. The participants’ doings and sayings are related to an object, the transfer of pictures. The episode also involves a kind of problem-posing. Nicole puts words to her concrete challenge in the situation, and Violet shares her known information and then opens up to other strategies of action so the task can be completed in another way. Informal talks with the participants later that day showed that all of these small interactions build knowledge, despite the fact that the participants do not put words to their actions while solving the task and the knowledge itself is not discussed. Nicole told me that this was her first time trying to transfer the pictures on her own. Even though she didn’t succeed, she wants to try again another time because Violet has shown her how to do it. However, she does not share these thoughts with Violet.
When I asked Nicole why she left, she shrugged and said that it was better that Violet did it because she knew how. Violet on the other hand expresses joy that Nicole started without her there; at the same time, she is disappointed because Nicole left before they were finished. She expresses a sort of powerlessness because she once again has to complete the task. She does not know if her actions and her sayings have done anything to help Nicole. Returning to the learning cycle, it seems as though the participants do not communicate and share when they are finished “solving” the problem, and so they do not know if their actions were of any importance. Focusing on this episode through the learning cycle reveals interesting aspects, but the explanations given indicate that it is necessary to consider more aspects beyond what is happening between the participants if we are to adequately describe and explain practice. With this goal in mind, I have chosen two dimensions of the episode upon which I will elaborate further. First of all, what agency does Nicole perform that makes her able to leave the situation and continue with another task? Secondly, is there specific knowledge required to perform digital actions?

Going beyond the “social” participants

None of the participants views as problematic the fact that Nicole leaves the table and trusts Violet to fix the media. Given Violet’s expression of powerlessness, this might be an expression of power in the relations and a local discourse. What discourses might construct these actions? Nicole is a preschool teacher and holds the lead amongst the practitioners, while Violet has no formal education or position, but she has worked for many years with children under six in different kindergartens. Because we move in between different discourses, different languages, and different networks, the meaning can never be established just by looking at words alone; action is also important. Words may be constituted through different discourses and mean different things to different people. However, a large part of the discourses are unarticulated. Informal talks with Violet and Nicole revealed that they were both taking part in a discourse close to the learning discourse we must challenge. Nicole did not want to be the adult who did not know how to do it. And Violet did not want to be the adult who challenged her leader, because we have never talked about it. This is in line with findings of other studies, where the workers’ designated position, and their recognition and power within their working group were significant factors in their learning. The terms “learning” and “learner” have been used in research on workplace and organizational learning as if they were unproblematic and as if there were some shared meaning in terms of what exactly they are meant to refer to (Boud & Solomon, 2003). In a discursive understanding, there is no such thing as shared meaning. Even though Violet and Nicole both highlight the term “lifelong learning”, they also accept situations in which adults choose to perform known actions instead of exploring the unknown. As practitioners, they carry out discourses that in some way point to what Schatzki (2006) refers to as structures in the organization, or what Kemmis and Grootenboer (2008) refer to as circumstances that go beyond each person and each community of practice. The position Violet and any other adult is given or is able to take is a part of the structure that makes action possible. Nicole is given a position through discourses that give her the power to choose what actions are acceptable to begin and to complete, which affects others’ actions and possibilities for performing inside the discourse.

What kind of knowledge?

The other dimension I would like to put forth arises from the last saying of Nicole: You are better than me. This raises a new question: Does digital practice require specific knowledge from the participants? Even though I have positioned knowledge as a social action, the concept is struggling to maintain itself as such. The struggle is not so much about whether knowledge emerges in social
relations, but in the question of whether knowledge is a part of the group or if it is a part of the individuals who participate in the group. Is it possible to understand knowledge in ways that acknowledge both positions?

Sfard (1998) claimed that science is caught between two understandings: learning as an individual action and learning in a social space. She used two metaphors in her further discussions on this topic. First, the *acquisition metaphor* is building on learning as the acquisition of something. This idea may be compared to the idea of individual knowledge. Second, the *participation metaphor* makes the group or community the unit of interest. The individual construction of meaning is replaced by processes that involve being members of certain communities. Packer and Goicoechea (2006) expanded this in their account of a sociocultural approach to social science, and it is close to the idea of learning I presented in my discussion of the learning cycle. Both metaphors are ontological in their questions about what learning might be and how learning emerges. Fieldwork episodes like the one presented illustrate why the idea of knowledge-building as solely a social idea need to be challenged. To elaborate further on the question of knowledge, I use an episode from the thematic category *action introduced by adult with change of lead.*

**Episode no. 2:**

Camilla is five years old. During the last hour, she has been helping Violet transfer pictures from the camera to the computer. She has also been given time to look at pictures in her own map/file and to talk about what comes to her mind as she is browsing the pictures. Violet has participated in a conversation with Camilla and three other children, regarding both the process of transferring pictures and the topics that emerge in looking at a wide range of pictures. She only leaves the table three times; each time, she is needed because of a conflict or accident among the other children playing in the room.

Informal and formal talks with the participants give insight into some of the aspects of their thoughts about learning and the need for individual knowledge as a premise for getting involved in digital practices. The transcriptions show that some of the practitioners express insecurity and discomfort with using digital tools, and therefore they do not want to get involved in such actions. Even though the participants often highlight the words “lifelong learning”, they do not seem to be willing to appear to be learners in front of the children. The fact that Violet has former experience and knows how to transfer pictures makes her able to do this with the children without appearing to be what the participants label as ignorant. Violet herself says,

> That is no problem. And here in kindergarten, the others see me as the one who knows how to do it. That idea of me differs from the idea I have of myself at home when it comes to digital tools. At home it is my husband who knows a lot and does most things. But I learn from him all the time and bring that knowledge with me.

This saying underlines the ideas Sfard (1998) raised. “Competence means being able to repeat what can be repeated while changing what needs to be changed” (Sfard, 1998, p. 9). How may learning be situated in the social if one does not consider individual knowledge? Violet says she brings knowledge from one arena into another. Her personal knowledge is situated in the *acquisition metaphor.* To challenge the participation metaphor as a representation of knowledge, I must make space for individual knowledge as a lens for understanding and analysing digital practice. Since “when two metaphors compete for attention and incessantly screen each other for possible weaknesses there is a much better chance for producing a critical theory of learning” (Sfard, 1998, p. 19), this juxtaposition of perspectives opens up the analyses to critical thinking and reflection. Greeno (1997) and Packer and Goicoechea (2006) claimed that the two metaphors make incompatible ontological
claims about the idea of learning. I argue that the complexity of practice and the sayings from the participants offer a new understanding that challenges a strict dichotomy of these two metaphors, and instead introduces individual knowledge as an important contribution in the analysis of practice.

Many of the participants note an issue closely connected to this; there is no training or education for professional workers in kindergarten regarding the use of digital technology, either in relation to the early childhood practitioners’ work concerning pedagogical documentation, or in how to use digital tools with the children. As a consequence, it seems like digital knowledge is personal in a way that is different from knowledge about children’s upbringing, play, learning, and other subjects linked to professional content. These other topics are discussed and reflected upon amongst the participants both formally and informally, and are therefore possible to envision within the learning cycle or in the idea of practice as a social site, as posited by Schatzki (2006). Ideas and insights that have grown through the development of kindergarten as a professional field seem somehow to be part of the structures in a way that is different from that of digital practices and knowledge about digital tools. This might suggest that digital practices are seen as an addition to what early childhood education is “actually” about, rather than as a part of practice (Yelland, 2006). Unfortunately, this also limits the practitioners’ options for critical reflection upon their digital practices. They do not produce resistance against actions involving digital tools. Even though the practitioners have access to digital tools, only some of the adults take part in knowledge-building and related discussions. The next episode highlights the tool as an agent in the action.

**Episode no. 3:**

*Camilla and her friends are playing computer games; Violet is in another part of the room. They take turns, and Anton, two-and-a-half years old, is next. He smiles. On the screen, a horse is running towards a barrier, and Anton has to make it jump to continue. When the horse is close to the barrier, Anton leans towards the screen and touches it. Nothing happens, and the horse is gone. A new horse is running towards the barrier, Anton touches the screen once more and nothing happens. He is no longer smiling. Camilla looks at him and then she takes his hand. “You have to use the mouse,” she says and puts his hand on top of the mouse. The horse starts running again. “Now! Click!” As she tells him what to do, she also clicks on top of his hand. The horse jumps and can continue running. Anton looks up at the screen and then down at the mouse. He clicks again, and the horse jumps one more time. “There you go,” Camilla says, “You are doing great!”*

This episode illustrates many aspects, one of which is Camilla’s knowledge and how she uses it to support and help Anton. Along with Camilla, Anton is capable of managing the game. Returning to the learning cycle, we do find several elements, like the sharing of strategies, the posing of problems, and the building of knowledge. The episode also illustrates what Plowman and Stephen (2007) noted about physical distance between adults and children when there is gaming involved. When the computer is used for games, the adults are seldom with the children. There seems to be an unspoken understanding amongst the practitioners that actions regarding games are the children’s own arena. This understanding can also be read as a discursive understanding. However, as shown in episodes 1 and 2, adults are present when it comes to activities involving the computer in activities other than games. This raises various discursive understandings related to the use of digital tools. Returning to LaTour, I would maintain that practice is more than discursive. Concepts are constitutive, but in an attempt to understand the interfaces and doings in digital practice, discourse alone is not enough. Neither is knowledge as an acquisition metaphor. This requires the addition of yet another concept to the contextual understanding of digital practice: materiality.
Materiality - a part of the construction of practice

Kemmis and Grootenboer (2008) discussed materiality as a constitutive factor in shaping and developing practice. The aspect I am examining here is the way Anton touches the screen in episode 3. It looks as if he has experience with some kind of touch technology, and that the use of a mouse and a computer is new to him. This example illustrates how materials hold agency in the ways they let us interact with them. The tool responds and contributes to shaping the actions of the participants. If we return to episode 1, Nicole’s reaction and possible actions are restricted both by the fact that she herself has the idea that she does not know how to do it and by the messages and actions from the laptop.

Posthuman ideas about materiality and discourse make social reality, represented by digital tools, a part of the construction of practice. Meaning-making emerges in between all participants in practice, both human and non-human. Following Latour (2005), “any thing that does modify a state of affairs by making a difference is an actor” (p. 71). This means that the laptop functioned as an actor in all three episodes presented here. In episode 3, the computer structured which actions Anton might take to interact. Of course, he can go on touching the screen, but since the computer is not built as a touch screen, that action will only be a dead end. Agency and agents understood in this sense is seen as a “…‘doing/being’ in its intra-activity” (Barad, 2008, p. 144). Barad views agency as a performative act, not something humans hold as an attribute, but rather something that requires action and doing to be activated. By moving the idea of agency from an intentional action of a human being to a doing in intra-active actions among both humans and non-humans, materials may be positioned as agents in the actions.

In the complex situations that arise from practice, there are no clear boundaries between personal knowledge, materiality, and discourse – they all act together. Practice, therefore, cannot be seen as only human practices. Discourse, materiality, and knowledge all constitute and carry practices and actions. In analysing digital practice, the answers differ depending on which lens we look through and the extent to which we choose to challenge scientific boundaries and representations of truth. This text moves understandings of learning and digital practice towards an onto-epistemological position.

Conclusion

To visualize the aspects presented in the discussion above, I propose an analytical space that offers more possibilities than restrictions. Through literature studies and preliminary findings in my data, I have identified three aspects that seem to be critical in practitioners’ constitution of digital practices: individual knowledge, discourse, and materiality. In some settings, these concepts will be difficult to distinguish and grasp when looking at practice because the field itself is quite complex.
Figure 2. Analytical space.

Figure 2 shows the original learning cycle in the middle, based on the idea that communication and sharing are crucial elements in building and shaping practices in groups or communities. Following the idea of going beyond shared experience and knowledge in a group of participants, we must not understand its central placement as indicating that it is the most important, but rather that it functions as a turning point. The concepts that constitute the sides of the triangle are concepts that have emerged so far and ones that matter in shaping digital practices in early childhood education.

In carrying out analyses in this field, there are several possibilities. One might choose one element from practice and look at it through the different lenses represented by materiality, discourse, and individual knowledge. The different lenses will provide different answers that may challenge each other in a scientific discussion. On the other hand, one might read one episode from digital practice through one of the lenses only. In this case, the analytical space will remind the reader that there is always more than one way of seeing the world, and the answers that appear are far from the “truth” about the digital practice field. Indeed, all of the answers are valid in scientific terms. This offers the scientist a choice. On the one hand, scientific models make representations of excerpts of a field and may produce interesting discussions, but at the same time, they require an adjustment as they are translated from practice into scientific terms. On the other hand, the researcher may let practice disturb those clear and divided understandings with its complex and ambiguous appearance. In this way, the triangle may open up for new readings, especially in the interfaces and the disturbances we find there. Following Sfard’s (1998) ideas of contrasting fields as each others’ critical opponents and Barad’s (2008) ideas of boundless meetings between intra-acting phenomena, the cycle may function as a melting pot or a mangle (Pickering, 1995), where new ideas and understandings are given room through transformation and difference. The corners of the triangle are not stable. This is meant to illustrate the idea that the impact the different concepts will have on understanding digital practice never will be stable. This enables the analytic tool to be open to different practices and diverse
readings. The triangle is not supposed to be fixed. Through exploring the idea of context as a construction that contains elements the participants themselves regard as important, the tool also allows for new bridges and critical readings of digital practice in the field.

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**References**


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1 The Norwegian term is *bør*, and I use the same translation as the Ministry of Education. The word implies a lower degree of commitment than the Norwegian term *skal*, translated as “shall”. The word *shall* is used 160 times in the framework plan, while the word *should* is used 30 times.

2 The research is done both in kindergarten and in early years of school.

3 The term early childhood practitioners is developed from Osgood (2006) and her term “early years practitioners”. The term includes both adults with no formal education and pre-school teachers.

4 Onto-epistemology is used by posthuman thinkers to combine the ideas of knowing (epistemology) and being (ontology). See more in Barad (2008), Hekman (2010), and Lenz-Taguchi (2010).