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Entanglements of Teachers, Artists, and Researchers in Pedagogical Environments: A New Materialist and Arts-Based Approach to an Educational Design Research Team

Sofia Jusslin
Åbo Akademi University, Finland

Tone Pernille Østern
NTNU Norwegian University of Science and Technology, Norway

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Abstract

This study investigates the collaboration between two teachers, a dance teaching artist, and a researcher within an educational design research project, that integrated creative dance into fifth-graders' reading and writing processes. To study this design team, we draw on the theoretical field of new materialism and the methodological field of arts-based research. Performing a diffractive analysis, we identify five entanglements in the design team and discuss how they affect the pedagogical realities and knowledge

generation. Considerations on how to create a safe environment, relate to data equipment, build trust, and reserve enough time for lessons and design meetings can act as guidelines when collaborating in design teams. (Re)considering and (re)thinking *who* the team members are, *how* they work together, and *why* they enter a design research project can provide deeper understanding of and respect for the important *what* aspect in EDR—developing valuable knowledge for educational practices.

Introduction

This study explores how a multi-professional design team, consisting of two teachers, a dance teaching artist, and a researcher, collaborate in an educational design research (EDR) project. Collaboration between practitioners and researchers are characteristic for EDR and contribute to bridging the gap between educational research and practice (Eri, 2013; Halvorsen, 2014; McKenney & Reeves, 2019; Ormel et al., 2012; Penuel et al., 2015). Studies have investigated collaborative partnerships in design research settings (e.g., Coburn & Penuel, 2016; Iversen & Jónsdóttir, 2018), but scholars rarely ask “who does the design” (Engeström, 2011, p. 600), and research on *how* members behind design teams work and affect the knowledge generation still remains scarce (Coburn & Penuel, 2016; Eri, 2013; Dyer & Löytönen, 2011; Iversen & Jónsdóttir, 2018; Thompson et al., 2017).

Seeking to reduce that research gap, our contribution to the research field of EDR comes with our attention on *who* and *how* in the design team. The team collaborated in developing teaching pedagogies that integrate creative dance into students’ reading and writing processes. Thus, the impetus for the research project was to advance theoretical and practical knowledge on how to teach reading and writing in a creative and embodied manner through dance, which also responds to the need for more empirical research on dance integration in school (e.g., Anttila, 2015; Bradley et al., 2013). The aim of this study is to investigate the collaboration between the design team members of the EDR project through consulting the fields of new materialism and arts-based research (ABR). We introduce new materialism (Barad, 2007) as our onto-epistemological framework and use ABR (Østern, 2017) strategies to broaden the understanding and approach to conducting EDR. The study adds to the design research field by raising the awareness of how researchers and practitioners collaborate in the material, pedagogical environment to enhance professional development and knowledge generation. We also contribute with knowledge about how professionals representing three different fields—school, higher education, and arts—come together to generate valuable knowledge for educational practices.

In what follows, we describe characteristics of the used EDR methodology and review previous research on design teams. After, we introduce new materialism and ABR. Next, we

present the aim and analytic questions of this study as well as the research material and the EDR team in detail. Thereafter, we analyze the material diffractively and discuss implications for pedagogical realities and knowledge generation.

Educational Design Research

Conducted by a design team with members of different expertise, EDR aims at improving educational practices to account for and impact learning and teaching in naturalistic and authentic settings (McKenney & Reeves, 2019). EDR is often conducted in collaboration between teacher education and schools and can function as a catalyst to involve teachers in research (see e.g., Gravemeijer & van Eerde, 2009; Iversen & Jónsdóttir, 2018; Østern et al., 2019).

We use McKenney and Reeves' (2019) methodological approach to design research as basis for the current project. The features of an EDR project can vary depending on, for example, the size of the study, the addressed subject area, and the scope of implementation (Ormel et al., 2012). EDR is characterized as theoretically oriented, interventionist, collaborative, responsively grounded, and iterative (McKenney & Reeves, 2019). It is theoretically oriented because existing theory not only frames the inquiry, but also shapes the design of a solution to a problem. However, EDR has been criticized for being theoretically under-conceptualized (e.g., diSessa & Cobb, 2004). Indeed, EDR of high quality needs to be theoretically informed throughout the whole research process (McKenney & Reeves, 2019). Updating the theoretical framework between research phases and cycles to fit the research agenda is a key feature of EDR. Being theoretically grounded also means developing new theory through the research; another key feature of doing EDR is thus theoretical development. As we mentioned above, this project is onto-epistemologically underpinned by new materialism to avoid the risk of merely contributing randomized knowledge that does not further the theoretical understanding.

EDR encompasses an intervention. The term *intervention* includes different kinds of solutions, which build on previous research and theoretical understanding of the problem. It can include educational products, processes, programs, or policies. EDR is collaborative because researchers work closely together with practitioners. An EDR approach is responsively grounded because the designs are shaped through participant expertise, literature, and field testing. Finally, it is iterative because the designs evolve over time through multiple iterations of planning, preparation, investigation, development, testing, revision, and refinement (McKenney & Reeves, 2019). The intervention—in our case referred to as teaching designs—itself constitutes the main practical contribution. Importantly, the designs are created for actual use and not for a hypothetical use. It is essential that the practical contributions, but

also the theoretical, of design studies are useful for practitioners and researchers outside of the design research team.

Design Teams

To understand the partnership formed within the design team, we use Smith's (2016) definition of a *partnership*, which refers to a relationship involving close cooperation between different parties with specified and joint responsibilities and rights, and who work together towards a shared goal to improve education. A partnership is a form of joint work that requires mutual engagement from its members (Penuel et al., 2015). Overall, members behind EDR projects have not received a lot of attention in previous research (e.g., Coburn & Penuel, 2016; Eri, 2013; Iversen & Jónsdóttir, 2018), which ignores the agency of its participants (Engeström, 2011). This differs from arts-based research (ABR) which often reflect upon the members behind the research, because that is usually necessary to understand the artistic process (Dyer & Löytönen, 2011; Leavy, 2018; Østern et al., 2019; Østern & Hovik, 2017). Penuel et al. (2015) have called for insights into how researchers and practitioners collaboratively design, develop, and implement strategies for improving teaching and learning. They acknowledged that working and collaborating in researcher-practitioner partnerships¹ is messy and more transformative than a one-way translation of knowledge from research to practice. Hence, knowledge travels on a two-way street in researcher-practitioner partnerships. Expecting that teachers change their teaching when participating in design research places them with equal footing with researchers (Gravemeijer & van Eerde, 2009). Successful design research often depends in part on sustaining the partnership between researchers and teachers (The Design-Based Research Collective, 2003) and recently, there have been calls for research to highlight both successful and less successful consequences that may arise in design research partnerships (Coburn & Penuel, 2016).

Partnerships should be open to and respect various forms of expertise, and members should decide in advance what their different responsibilities are (McKenney & Reeves, 2019; Smith, 2016). In heterogeneous teams, it is important to ensure that all members are engaged in a way that their personal expertise is used and valued (McKenney & Reeves, 2019). Whereas researchers often represent subject matter specialists, practitioners often “keep it real” by voicing interests and concerns about the naturalistic context in which the research is conducted. Teachers' involvement in collaborative design is suggested to be beneficial for teachers' learning, but few studies address such issues (Voogt et al., 2015).

¹ We refer to design teams and researcher-practitioner partnerships interchangeably.

Design team members often have different roles and responsibilities throughout the research process (The Design-Based Research Collective, 2003; McKenney & Brand-Gruwel, 2018; McKenney & Reeves, 2019; Ormel et al., 2012). Such roles include, for example, researcher, designer, and teacher. Multiple roles present both opportunities and challenges for the design team members (Ormel et al., 2012). Different roles provide different perspectives on the conducted intervention and affect the creation of new knowledge; teachers as researchers can view their students from a new perspective, whereas researchers as designers can gain a deeper understanding of the solution to an educational problem. In a review of research literature on researcher-practitioner partnerships, Ormel et al. (2012) found that the roles of teacher/researcher/designer often overlap in smaller design research projects, and that practitioners are often collaborative partners in the design, but their involvement is often not discussed in relation to the knowledge generation. Similarly, Lorentzen (2017) found that teachers are repeatedly portrayed as passive partners in design research. When studying micro-communication of a design team consisting of two teachers and one researcher, Iversen and Jónsdóttir (2018) found that the researcher's role was mainly perceived as an observer and "a bit more than a fly on the wall" (p. 22), whereas the teachers implemented the design. Ormel et al. (2012) further claimed that social aspects in design teams can influence how the designs and knowledge generation are formed.

Professional development for design teams is one of the contributions of EDR (McKenney & Reeves, 2019; Voogt et al., 2015). A joint aspect of design research is that the design should be relevant and generate useful knowledge for teachers in educational practices—also outside the practice where the research is conducted (e.g., Iversen & Jónsdóttir, 2018; McKenney & Reeves, 2019; Thompson et al., 2017; Voogt et al., 2015). However, literature on ABR seems to be more focused on the knowledge generated being valuable and meaningful (Leavy, 2018). Further, design research can serve as powerful professional development for teachers as they participate in the design of improving the conditions for learning and teaching in their specific teaching practice (Gravemeijer & van Eerde, 2009).

New Materialism

This project is onto-epistemologically positioned within the field of new materialism (Barad, 2003, 2007; Dolphijn & van der Tuin, 2012; Coole & Frost, 2010) to account for and problematize alleged boundaries between body/mind, theory/practice, researcher/researched, and discourse/matter. New materialism moves beyond an anthropocentric ontology and perceives knowledge as created in relations between human and non-human bodies. Thus, new materialism aims at understanding relations between matter and meaning, which are not separated. Instead, the relations are understood as intra-active becomings of the world. Barad (2010) explained this with *entanglements* which "are not intertwinings of separate entities, but rather irreducible relations of responsibility" (p. 265). Further, Barad (2003, 2007) used the

notion of *performativity* to explain such entanglements, and *intra-action* to acknowledge that entities are not separated and distinct subjects and objects. A performative understanding challenges the representational belief that language can represent pre-existing things, and that knowledge is bound to verbal language (Barad, 2003). Moreover, *intra-action* differs from *interaction* which requires the existence of independent entities that interact with each other.

Humans are part *in* the world, rather than part *of* the world. Epistemology and ontology are entangled to an *onto-epistemology*, according to Barad (2007). Barad claimed that knowing does not come from a distance, but from a direct engagement with the world. Therefore, the researcher's body cannot be understood as separated from the bodies, materials, and contexts in the research project (Østern & Hovik, 2017). Rather than attempting to conduct research from the perspective of bodies and materials, we also read the research material through our own bodies as researchers (Lenz Taguchi, 2012a). This indicates that our bodies, as well as the design team's bodies, also are part of the research materials.

In this study, we turn our analytic focus towards investigating entanglements in the design. When considering the entanglements of the design team, *agency* becomes an important concept. Barad (2003, 2007) claimed that agency is not something that someone or something has, rather it is a matter *intra-acting*. It is about *doing* and *being*; it is an enactment. The agency of the design team becomes of importance, but so does the agency of non-human matter. Different *performative agents* (Barad, 2007) become performative by producing *affect*. Affects are not to be understood as emotions or feelings but as prepersonal intensities that are volatile and pre-linguistic and can be understood as diverse, different, sensory embodied experienced materialities (Deleuze & Guattari, 1987; Østern & Dahl, 2019). As such, the design team members become performative agents *intra-acting* in relation with other performative agents as they develop teaching pedagogies with creative dance.

Barad (2007) used the concept of *diffraction* in a metaphorical sense to highlight entanglements between material and discursive practices. Diffraction is an optical and physical phenomenon explained as a wave that encounters an obstacle and thereby, spreads in other new ways than it otherwise would have done. It differs from *reflection* which reflects the same mirrored image. Instead, diffraction is focused on differences, not sameness. A diffraction process identifies differences and opportunities depending on how different performative agents *intra-act* with each other. This does not indicate that the design team did not reflect on the research process; reflection is notably an important part of EDR (McKenney & Reeves, 2019). Reflection was done at the scene and during design meetings, and diffraction was done when analyzing the empirical material and in reporting the research findings. We elaborate on the concept of diffraction more in detail later in the study.

According to Rosiek (2018), new materialism does not attempt to fix mistakes or refine a research design, which collides methodologically with EDR. The idea with new materialism is not to describe *the* reality, but to create *a* reality out of many different realities that could have been created. As such, creating other pedagogical realities than the ones in the current project would be no less real (Rosiek, 2018). It would simply become another reality. This research design positions the design team deeply and intimately entangled with the students, the dancing, the writing, and the material context of the physical school environment. As such, the refinements in the project are not perceived as mistakes or limitations, but as other realities created in relations between the design team, the students, and the daily school life. When working creatively with arts, it is impossible to create a design, adaptable in different contexts in the exact same way and we cannot predict how the learning and knowing will take shape (Lenz Taguchi, 2012b). Our design constitutes dynamic teaching pedagogies, not a static model or method.

We argue that new materialism offers a valuable approach to EDR by taking into account how the knowledge contribution can be described in ontological terms. Kuby et al. (2019) argued that educational research has for too long focused only on epistemology, which is too limiting. Further, St. Pierre (2013) acknowledged new materialism as a signal that the ontological can no longer be ignored. New materialism gives an onto-epistemological perspective to EDR in viewing humans and non-humans, theory and practice, as well as researcher and the researched as intra-active. Moreover, new materialist theory has radical implications for qualitative methodology (Hultman & Lenz Taguchi, 2010; Koro-Ljungberg et al., 2018) and it moves EDR towards post-qualitative inquiry. This study uses a qualitative EDR methodology but shifts focus to go beyond merely humans pursuits through the use of new materialist onto-epistemology and analytic engagements. Thus, this study moves between qualitative and post-qualitative inquiry (see St. Pierre, 2019; Østern & Letnes, 2017); the study is characterized as *(post)qualitative*.

Arts-Based Research

In the EDR project, we use research strategies from arts-based research (ABR). ABR can be understood as meaning-seeking processes which involve the active use of forms of expression and modalities (Leavy, 2018; Østern, 2017). In ABR, different art forms are used in the research process and as the research text. It is often combined with qualitative methodologies (Leavy, 2018) and functions as *practice-as-research*, which is similar to other qualitative—non-artistic—research methodologies (Østern, 2017). ABR has, like EDR, a transformative character (Leavy, 2018; Østern, 2017). The ABR agenda is neither descriptive nor explanatory, but seeks to understand, interpret, and approach meaning-making as well as create action and contribute to change (Østern, 2017). Changes can be done with the art itself, its participants, the educational and professional contexts, as well as on local and societal

levels. Consequently, we see relations between EDR and ABR with their practice-near features.

We use ABR strategies alongside the adopted EDR methodology as we do research *with* and *through* different art forms; part of the knowledge generation is available in the art forms used in the project. ABR also enables us to make visible aspects of the design team that otherwise might be overlooked, and to deepen our understanding of entanglements in the team. Existing at the intersection of art and science, doing research with arts is emotional, captivating, and lived, and it moves and affects the participants by being personal and close (Anttila & Svendler Nielsen, 2019; Barone & Eisner, 2012; Leavy, 2018; Østern, 2017). Thus, an ABR approach enables us to shed light on the research process in an otherwise inaccessible way that focuses on affective, holistic, relational, transdisciplinary, participatory, and artistic aspects (Leavy, 2018). As such, ABR can, according to Østern (2017), arise a feeling of being affected and touched by the research process. This is how using and acknowledging the value of ABR strategies can contribute to the field of design research; participants involved in the research are inevitably personally involved and emotionally invested. Additionally, new materialist theory is well suited for ABR (Hickey-Moody, 2018; Rosiek, 2018) as artists are familiar with affecting and working upon different materials as much as the materials affect and work upon them.

To investigate the collaboration in the design team, we also engage analytically with ABR strategies. More specifically, we put Østern's (2017) methodological approach to ABR to work in a performative manner in our analysis. Østern (2017) proposed *form, meaning, nearness, body, context, ethics, and diversity* as methodological *propellers* which have particular influence on methodological considerations and choices when doing ABR (see Figure 1). However, we extend the concept of meaning to *meaning-making* as we view meaning as an active and dynamic process rather than static and fixated, which resonates the performative perspective of new materialism. These propellers, Østern (2017) explained, challenge, give impetus, and provide direction to the ABR process. Considering these propellers when reading *with* theory in the analysis, we are enabled to (re)think, (re)experience, and (re)feel the collaborative work of the design team.

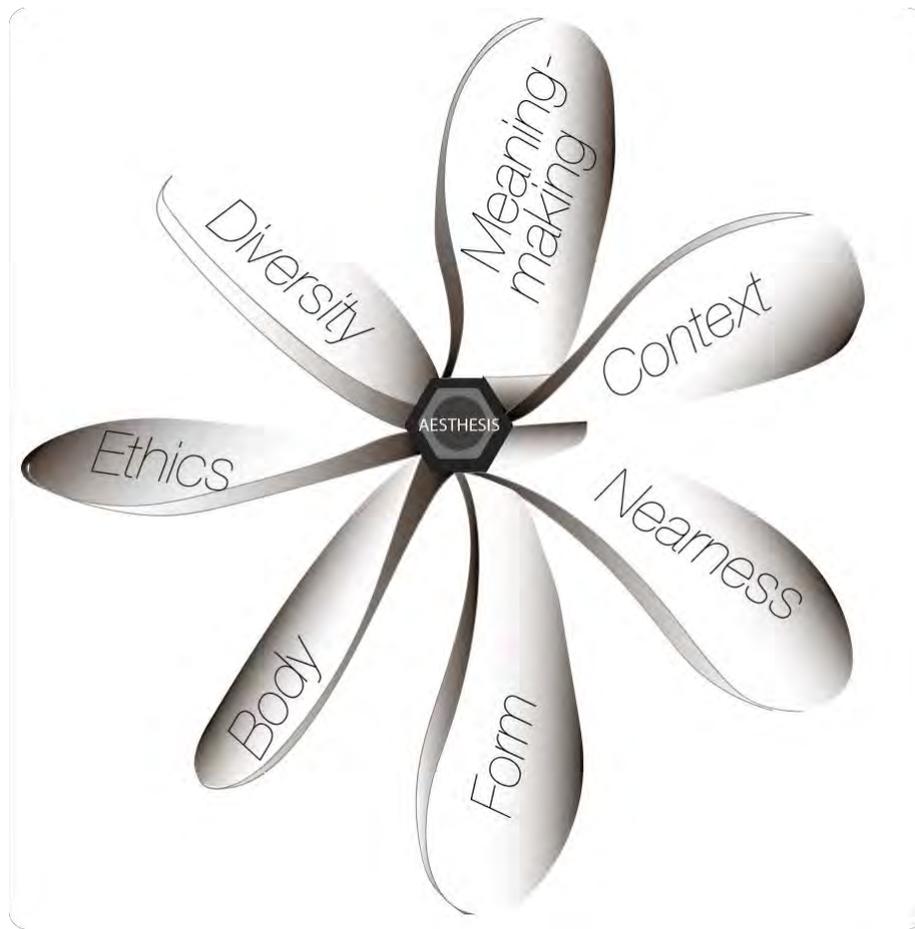


Figure 1. Updated English Version of Østern's (2017) Methodological ABR Propellers (Visual Design: Mari Ann Letnes, 2017).

The EDR Project

Aim and Analytic Questions

The overarching aim of the current EDR project is to develop and investigate pedagogies that integrate creative dance in first language (L1) and literature education. This study focuses on the design team's planning, implementation, and evaluation of the first research cycle that integrated dance into fifth-graders' reading and writing processes in a Swedish-speaking

school in Finland.² The aim of this study is to investigate the collaboration between the design team members of the EDR project through consulting the fields of new materialism and ABR. The analysis is guided by these analytic questions:

1. How are the design team members entangled with each other as they collaboratively develop teaching pedagogies that integrate dance in reading and writing processes?
2. How are pedagogical realities and knowledge generation affected by the qualities of the entanglements in these specific pedagogical environments?

Research Material

The design team included the first author, Sofia Jusslin, a dance teaching artist, and two teachers. Sofia was a certified primary school teacher and subject teacher in Swedish and Literature education currently conducting doctoral studies in educational sciences while also teaching and supervising within teacher education at Åbo Akademi University in Finland. Sofia administered the assembling of the design team in October 2017 starting with finding an expert within the dance field. She contacted the Regional Dance Centre of Ostrobothnia³, whose managing director introduced dance teaching artist Lotta Kaarla⁴ to Sofia. Lotta was a trained dancer graduated from Balettakademien in Stockholm, Sweden. Although the ideal was to find a certified dance pedagogue, Lotta joined the design team, motivated by her long experience in teaching dance to children and shared pedagogical beliefs with Sofia about dance in school.

The search for a project school began and grade five was chosen as the intended target group, because children at that age can approach movements in a playful way while being able to reflect upon their experiences and learning. Sofia contacted eight primary schools in December. Two teachers, at one of the schools, announced interest in the project. In January, teachers Ann-Charlotte (A-C) Nyman and Tom Lithén met with Sofia who provided information about the project. A-C was a certified primary school and special education teacher with seven years of teaching experience at the project school *Norra Korsholms skola*, and Tom was a certified primary school teacher with eighteen years of teaching experience at the same school. They had worked together as teachers in parallel classes for five years and neither one of them had any experience of creative dance integration. They joined the project

² Prior studies in the project laid a foundation for this research cycle. The teaching pedagogies were developed based on the *Dance Literacy Model for Schools* (Jusslin, 2019a) and the pedagogical content (see Jusslin & Höglund, 2020) was partly a continuation from a pilot study (Jusslin, 2019b).

³ www.pohjanmaantanssi.fi

⁴ The design team and the project school gave informed consent to publish real names. They read and accepted the manuscript prior to publication.

because they were interested in developing themselves as teachers and their teaching practices.

This study focused on the design team's planning, implementation, and evaluation of the first research cycle that integrated creative dance in students' reading and writing for thirteen weeks. Hence, the team combined curricular and dance-specific learning objectives, as recommended in the Dance Literacy Model for Schools used in the project (see Jusslin, 2019a). The research cycle contained two teaching designs. The first design integrated dance in students' writing of detective stories and all students wrote an own book. During the nine-week long teaching design, dance was used to explore and develop inner and outer characteristics of characters, to explore and describe different environments in which the stories played out, to develop and expand sentences focusing on the use of word classes, and to provide constructive feedback to writing. The second teaching design, reported in detail in Jusslin and Höglund (2020), lasted for three weeks and integrated dance into students' poetry reading and writing. First, the students read a poem that they interpreted bodily through dance. After, all students wrote their own poems with the theme of friendship and created dances for their own poems together with their classmates. The field work ended with an evening dance show in November. In the dance show, the students performed dances they had created, read texts they had written, and danced literature they had read and interpreted.

The design team decided responsibilities for the classroom floor: Lotta had main responsibility of the dance lessons, A-C and Tom had overall pedagogical responsibility of the students and non-dance lessons, and Sofia led the team and was responsible for the data equipment and the theoretical framing of the project. Sofia sought to communicate the theoretical framework and previous research from the research field to the team throughout the project. Whereas this set up was the starting point, the design team sometimes deviated from the responsibilities due to various reasons. For example, Sofia taught some dance lessons with large emphasis on subject specific knowledge in Swedish and literature, and Lotta handled the data equipment when Sofia was on sick leave.

We analyzed two types of research material. First, we analyzed living material, as in the design team's bodily presence in and experiences of the research cycle. These materials escape language and can be conceived as emotional, sensual, and response materials (see St. Pierre, 1997). To clarify, emotional materials included emotional aspects of doing the research, sensual materials included the bodily act of participating in the research context, and response materials included responses given by team members, students, and other peers (e.g., supervisors and colleagues). As such, we focused on how bodies intra-acted to plan, create, and evaluate the teaching pedagogies, how the team faced and overcame challenges, collaborated and negotiated on the classroom floor, danced, wrote, and read together, and how

it felt during the research cycle. The bodily presence and experiences of the second authors, Tone Pernille Østern, also contributed as research material as she participated as audience in the dance show. We were *bodilyminded researchers* (see Maapalo & Østern, 2018) with meaning-making agency in the project's knowledge generation.

Second, we analyzed the design meetings of the first research cycle. Five extensive meetings were held to plan and evaluate the teaching designs conducted in September–November. Two meetings were held prior to the teaching sequences (May and August), two during (September and October), and one after (December). Research materials from the design meetings included audio recordings, notes and protocols, and lesson designs. Meetings focusing on planning the research cycle were documented in writing, whereas meetings focusing on evaluating the research cycle were also audio recorded. This choice was based on the different purposes of planning and evaluation during the meetings. Ultimately, these research materials were non-hierarchical; we did not foreground a certain type of material, but instead read the different types of research material *through* each other.

Analytical Approach

Diffraction identifies differences in themselves without doing comparisons. The focus is on differences that make a difference; differences that are of importance for the pedagogies produced. In other words, rather than comparing research materials, or “themes”, against each other, diffractive readings are done *through* and *around* different research materials (Barad, 2007; Lenz Taguchi, 2012b; Murriss & Bozalek, 2019). Barad (2007) stressed that “a diffractive methodology provides a way of attending to entanglements in reading important insights and approaches through one another” (p. 30). The focus on differences, the performativity of the research process, as well as the active acknowledgement of arts-based materials, and human/non-human relations made the analysis more post-qualitative than qualitative. We analyzed in what ways, when, and why productive differences arise in the design team and consequently affect the knowledge generation. We diffractively read our research material through each other and through new materialism and ABR.

Agreeing with Lenz Taguchi (2012a), we understand a diffractive analysis as embodied engagements with the research material; “a becoming-with the data as researcher[s]” (p. 265). New materialism and ABR were together with the whole research process—and also the design team and the students—an *apparatus of knowing* (Barad, 2007) that produced the researched phenomenon. Barad (2007) explained that “[a]pparatuses are not passive observing

⁵ Tone was one of Sofia's supervisors.

instruments; on the contrary, they are productive of (and part of) phenomena” (p. 142). As such, we used new materialism and ABR as apparatuses to trace entanglements of the design team with *agential cuts* (Barad, 2007). To analyze an entanglement, it has to be frozen, which means enacting an agential cut in the research material. An agential cut can bring things together, but also take them apart (Barad, 2007). We were responsible for the agential cuts we enacted, not only because we chose the cuts but because we were agential parts of the research material; we were not at a distance from it (see Lenz Taguchi, 2012a). Therefore, we—as part of the apparatuses of knowing—were not passive, but productive of and part of the phenomena (Barad, 2007; Lenz Taguchi, 2012b).

The analysis included two parts. The first part related to the first analytic question and was of empirical nature. We performed the diffractive analysis and enacted agential cuts in five entanglements from the research material. The analysis was mainly performed by Sofia, but *read through* the different types of research material, the design team, and Tone. Further, they were chosen with guidance from the ABR propellers (Østern, 2017). Everyone agreed that these agential cuts made the most difference in the process of working together in the project, thereby motivating why these cuts were enacted. The result section includes excerpts to exemplify the entanglements. We chose the excerpts because of their *glow* (MacLure, 2013). These excerpts glow and glimmer in the research material as they invoke something intangible and embodied in the analysis in relation to the entanglements. The methodological ABR propellers also enhance this glow. In the result section, the propellers are marked with *italics*. Importantly, *meaning-making* acted as a propeller throughout the whole project, but was more prominent in certain entanglements. The second part of the analysis is presented within each entanglement and answers the second analytic question. That part highlights implications for pedagogical realities and knowledge generation in a methodological manner.

Entanglements of the Design Team

In this section, we present five entanglements that were active in the design team: 1) safety and presence; 2) from *behind* the camera to *with/in front of* the camera; 3) building trust; 4) time as prerequisite and obstacle; and 5) design meetings as performative events. The entanglements serve as subtitles and are presented with empirical examples. All excerpts were translated from Swedish to English by Sofia. Within each entanglement, we discuss how qualities of the entanglements affected pedagogical realities and knowledge generation, which—in line with Barad’s (2007) onto-epistemology—cannot be separated in the pedagogical environment. As emphasized in Figure 2, the entanglements are also entangled in themselves. For clarity, the “we” now refers to the design team and the team members are referred to in the third person.

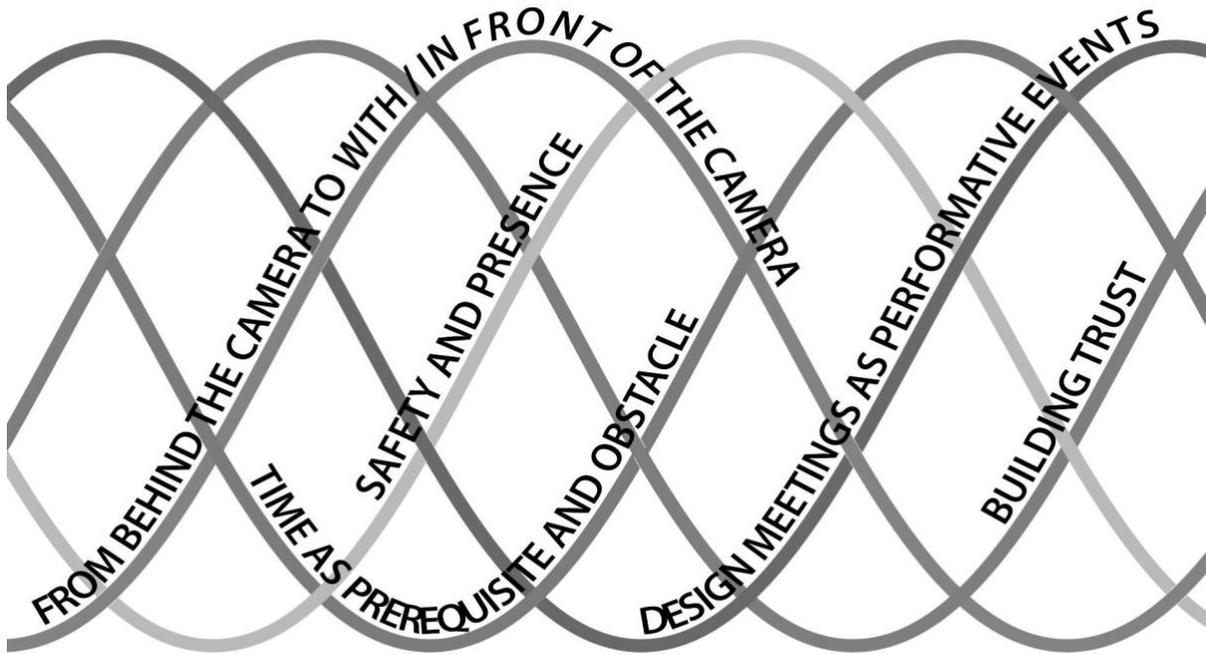


Figure 2. Entanglements of the Design Team. (Visual Design: Sofia Jusslin).

Safety and Presence

Excerpt 1: Design meeting 4

Sofia: It is design research in a nutshell. Kind of like trial and error.

A-C: Well, I still think that we kind of allow everyone to try and to fail and it is still not a problem, the flexibility of it is great.

Lotta: Yes, and I wrote that too, to try and fail. And I feel comfortable doing it, it doesn't feel uncomfortable.

A-C: No. Because usually it is probably the case that, or as I feel for my own part and especially with dance teaching, it is not at all something that I am comfortable with, but you have still allowed yourself to open up in a way. At least you feel comfortable now, even though it isn't.

Tom: Ria⁶ commented on that too. She was impressed by the students and how they were so safe with each other. That they actually dared and commented and gave feedback, and that is important.

⁶ Ria Heilä-Ylikallio, one of Sofia's supervisors, observed a lesson where the students worked with constructive feedback on their writings through dance.

Sofia: Yes, about the students, but also us together with the students, and also just us. Safety is important when trying something new.

At first, Sofia sensed an uncertainty from all participants, which depended on that it was a new *context* for all of them; design team and students alike. This uncertainty—the feeling of not knowing what to expect—changed after five weeks. After having learnt the *form* of the dance lessons and the feeling of being allowed and encouraged to try and fail (see Excerpt 1) had sunk in, the team started feeling safer with the new teaching content, and with each other. The agency of this safety was deeply entangled with the *bodily* presence and support of the team members. Every dance lesson, at least one member of the team was always present on the classroom floor (see Figure 3). When Lotta taught a dance lesson, A-C or Tom were there; they participated in the teaching, they danced, wrote, and read with the students. This *nearness* created a sense of that the teachers were with Lotta, and not merely passive observants. If A-C or Tom's *bodily* presence was removed from the teaching situation, Lotta would be forced to take on another responsibility in this specific *context* and the dynamic between Lotta and the students would be affected. The teachers were experts in classroom management in their classrooms; they have a relational connection to their students that cannot be replaced by someone else. Classroom management was a professional competence they contributed to the team, in addition to their local relational competence, which made Lotta and Sofia feel safe in the new *context*.



Figure 3. The Design Team on the Classroom Floor: From the Left: Tom, Lotta, and Sofia. Ria Stands in the Back.

Pedagogical Realities and Knowledge Generation

Safety and presence affected the pedagogical realities and knowledge generation in terms of professional development in the design team as well as the teaching that took place on the classroom floor. The qualities of safety and presence contributed to enhancing the team's receptiveness towards the new content of creative dance integration, which can be seen as a prerequisite for professional development. Not feeling safe and not having the other team members present would have affected the knowledge generation in regard to how the team was able to collaboratively develop teaching pedagogies. In turn, professional development intra-acted with the knowledge generation; the team members had to develop themselves and broaden their perspectives to collaboratively create ways to integrate creative dance in reading and writing processes. The presence of team members with different expertise enabled the creation of pedagogical realities with holistic, transdisciplinary, and artistic teaching and learning, and facilitated the fulfilling of curricular and dance-specific learning objectives (see Jusslin, 2019a). Additionally, as the teachers entered the project with the main endeavor to develop themselves, the qualities of this entanglement suggest that their individual ambitions were fulfilled.

From Behind the Camera to with/in Front of the Camera

The initial idea was that Sofia would only stay behind the camera. That *context* quickly changed on the first dance lesson. Sofia felt a need to share her subject-specific knowledge in the teaching situation to support the students' *meaning-making*. Still, the transition from behind the camera to with/in front of the camera did not indicate that Sofia did not trust her team members' abilities, but that she felt that she was more needed somewhere else than behind the camera. During the meetings, the team stated that all three perspectives—researcher, teacher, and dance teaching artist—were needed right then and there on the classroom floor. The realization of not being able to restrain herself from leaving the camera and being part of the teaching, was an internal struggle for Sofia when considering how the methodical, and also *ethical*, choice would affect the project. The “pull” to leave the camera reoccurred multiple times, which changed the entire *context* around the camera. The students approached Sofia, and she approached them; she was *near* them and part of the *meaning-making* on the classroom floor (see Figure 3).

Sofia took on a more active role in the teaching than originally planned, but still handled the data equipment. When the students saw the camera, they knew that they would have a dance lesson that day. Eventually, the camera and Sofia became “one” for the students. This was prominent on a lesson when Sofia did not participate but had Lotta handle the camera. In the beginning of that lesson, the students said hello to Sofia to the camera. Sofia was not *bodily* present, but she was still there; they knew she “was watching”. The move from behind the

camera to with/in front of the camera enabled *diversity* and Sofia to be a bodyminded researcher with a dual perspective. Sofia's eyes (as body and as camera) intra-acted and could simultaneously be directed towards multiple events.

Pedagogical Realities and Knowledge Generation

From *behind* the camera to *with/in front of* the camera affected the pedagogical realities and knowledge generation in terms of Sofia's role in the implementation of the teaching designs as well as the production of research materials with the camera. Sofia's intra-action with the camera changed her agency on the classroom floor, thereby affecting the pedagogical reality of the research project. From initially having most agency in planning and evaluating the teaching, Sofia's enhanced agency in the implementation of the teaching strengthened and deepened the L1 and literature educational focus in the teaching situations. Qualities of this entanglement altered the methodological focus towards a more pronounced post-qualitative research approach. This made the boundaries between the roles of teacher, artist, and researcher fluid; we had simultaneous roles on the classroom floor.

Building Trust

Excerpt 2: Design meeting 4

A-C: In some way, I think that we have got, or that thing you said Sofia, that we are in charge of certain areas and I think that has worked out well. Lotta has been responsible for the dance, you have been the group leader and we have the pedagogical responsibility of the students, and in some way, I think that that's it. It has worked out well. You have felt like; this is what I'm good at and this is my contribution to the project.

Tom: Yes, I sometimes thought about when you do something like this, that you always worry when someone else comes in and takes your class and starts working with something. Will this be properly done? Are they doing like you would do it yourself? You don't really trust people when they come into your class.

A-C: And also, will they make it work?

Tom: Yes, but here you don't feel that way. You would never worry and think, no, now they are here and it will become like that, because that often happens when somebody else comes in, that you get a bit hmmm maybe. I have absolutely not felt like that in this project.

Our responsibilities were clearly communicated from the beginning. We highlighted and appreciated the *diversity* of the team, which began building mutual trust between the team members. We got to know each other, had fun together, faced, and overcame challenges

together, and felt how close and *near* we became in our *meaning-making* processes. As we got to show each other what we were good at, we realized what someone else was better at and learnt to trust in each other's abilities; we even found ourselves being amazed by each other's abilities and sought to learn from each other. Trust was built in the transition from separated, individual fields of expertise to entangled shared expertise as a team. When the students felt the trust that their teachers had towards Lotta and Sofia, it contributed in building trust between Lotta, Sofia, and the students. We felt that the trust built on personal relations and mutual respect, which takes time to build. Once we had started building trust in the team, we were able to deviate from our original *context* and responsibilities. For example, Sofia trusted the others to handle the cameras during the days when she could not participate, and Lotta trusted the others to have dance lessons without her.

Pedagogical Realities and Knowledge Generation

Building trust affected the pedagogical realities and knowledge generation in terms of changing responsibilities as well as coherence in the design team. Feeling your team members' trust contributed to becoming confident with the new teaching content; dance was new to A-C and Tom, and L1 and literature education was new to Lotta. Developing confidence also affected how we trusted ourselves and our abilities. When we signaled that we were confident, excited, and motivated, it affected the learning atmosphere and how receptive students were towards the new content. The trust the team had built up might have enabled the creation of otherwise inaccessible knowledge. In addition, having the strong trust at the end of the research cycle, the design team members supplemented each other. In this performative enactment, we leaned on each other's strengths, expertise, and experience, while helping each other overcome possible shortcomings.

Time as Prerequisite and Obstacle

Excerpt 3: Design meeting 5

Lotta: I wish we would have done every lesson twice.

A-C: Yes.

Tom: Yes.

Sofia: Yes, doubled the length of the lesson.

Lotta: That we could repeat it once more, to move a little bit forward, but we didn't have time for that. Every time, we had a new theme and that became difficult. I would have liked to do every lesson twice.

Sofia: I agree.

Tom: It is good to do that when you try something completely new.

Sofia: Yes, it would have helped us and them (the students).

In the teaching designs, time was our largest obstacle. Even though we carefully planned the teaching designs, we were too time optimistic about the length of the students' reading and writing processes. This was noted during the last meeting of the research cycle (see Excerpt 3). At times, we felt stressed when working against the clock in this new *context* and experienced how more time would have been in favor of the students' *meaning-making* processes. Mid-fall, A-C reflected that the one thing that disrupted the research project, was all the other duties of being a teacher that took time and concentration away from the project. Still, no matter how precisely you plan lessons, in primary school you must account for unexpected situations (e.g., schoolyard brawls). Hence, as external persons, Sofia and Lotta sought to be respectful and considerate for everything outside the project to account for the well-being of the students and teachers and the school day overall.

Positive time aspects were the time we took for meetings and our flexibility as a team. Time was a prerequisite for our *meaning-making* processes in planning and evaluating the teaching. We met regularly and set aside time to plan and evaluate, but also to get to know each other. Giving time for meeting *body* to body proved to be important. Teachers rarely have the time to reflect on their teaching practices and students with external professionals, making this time we took together extremely valuable not only for developing teaching pedagogies, but also for our individual and collective professional development. This time created a *nearness* in the team, and it fostered safety and trust. When we faced challenges in the teaching designs or realized that we had to deviate from our original design, we were flexible and improvised together. The unexpected need for improvisations was enabled by the trust we had in each other.

Pedagogical Realities and Knowledge Generation

Time as prerequisite and obstacle affected the pedagogical realities and knowledge generation in terms of developing embodied knowledge about creative dance integration as well as strengthening professional development in the design team. The agency of time had large impacts on the pedagogical realities and knowledge generation. First, considering that it was our first time working together and the students' first time trying creative dance integration, a shorter research cycle would probably not have been successful. The thirteen weeks gave us and the students enough time to develop embodied knowledge about what creative dance integration meant in the context of L1 and literature education. Embodied knowledge does not develop overnight (Alerby & Ferm, 2006), but once students have knowledge of creative dance integration, the teaching designs integrating dance can be shorter. Second, longer lessons (see Excerpt 3) would reduce the stress factor and provide more room for students' meaning-making processes, which would affect the knowledge generation. Third, time for planning and evaluating was essential and necessary for conducting a successful research

cycle. Based on our evaluation of the lessons, time aspects were a main consideration for the next research cycle.

Design Meetings as Performative Events

The meetings became our “center”; a *context* where trust was built and where we felt safe to share our opinions and concerns. Sofia’s intention was to create an atmosphere where everyone could share how they felt and what they experienced and thought. Everyone should be seen, heard, and valued. We met after school hours to plan and evaluate the teaching designs. Sofia prepared agendas as foundations for each meeting. This *form* enabled the meetings to become performative events as the discussions and decisions made during a meeting could entirely change the direction of a teaching design. We used a cloud service to share lesson designs and agendas. The intention was to comment on each lesson on the cloud service, but we quickly realized that there was not enough time for the teachers and that it was more valuable for the team to discuss in depth during meetings.

All design team members experienced that meetings were extremely valuable and necessary to bond as a team and to be able to accomplish the—at times challenging—undertaking of integrating dance in reading and writing processes. It was during the meetings we realized our own *diversity* and how we supplemented each other. Everyone was needed at the meeting; all different perspectives were important. Once we realized this, we felt the *nearness* of each other and agreed that we had been successful in our different responsibilities during the teaching sequences and in the team overall (see Excerpt 2).

Pedagogical Realities and Knowledge Generation

Design meetings as performative events affected the pedagogical realities and knowledge generation in terms of becoming a team with shared expertise that combined theory and practice. Who we were as well as what we brought to the team and to the meetings shaped the pedagogical realities of the project and what kind of teaching pedagogies we were able to develop. Rather than having one ideal person with expertise in the three respective fields, we became the ideal team because we supplemented each other to conduct the project. One person could not have done it alone. Together with the classroom floor, the meetings became the meeting point for theory and practice. Sofia’s theoretical knowledge became entangled with the other team member’s practical expertise. Without the meetings, there was a risk that theory and practice would have remained separated, pointing to the meetings’ important agency within the EDR methodology to produce new theoretical understanding. The “we” refers to the authors in the remainder of the study.

Concluding Discussion

When studying the design team, we entered into a dialogue with new materialism combined with ABR to investigate how entanglements of the design team affected the pedagogical realities and knowledge generation. The diffractive analysis shows that the qualities of the five entanglements provide both opportunities and challenges for the pedagogical realities and knowledge generation. However, the conclusions we draw here are prevalent in the investigated design team in this particular study and we do not claim that they are applicable in all kinds of design teams. Nevertheless, we argue that the qualities of these entanglements are important to contemplate when entering a collaborative partnership. Considerations on how to create a safe environment, relate to data equipment, build trust, and reserve enough time for lessons and design meetings can act as guidelines for shaping partnerships between teachers, artists, and researchers. That would contribute to raising the awareness especially on the *how* aspect behind the design, which there has been a lack of in previous research (Coburn & Penuel, 2016; Eri, 2013; Iversen & Jónsdóttir, 2018; Thompson et al., 2017). With the project's (post)qualitative approach to EDR, all team members inevitably affect the pedagogical realities and knowledge generation. In this study, this justifies that a researcher is not and cannot merely be "a fly on the wall" (cf. Iversen & Jónsdóttir, 2018). The team is not only responsible for but also *part of* the developed teaching pedagogies.

We acknowledge that *how* and *who* are entangled in the design team. *Who* the team members are affects *how* they are able to conduct research. In turn, this has implications for *what* the team is able to develop. Therefore, we argue that the partnership behind the design is important to consider in regard to the knowledge generation. Another aspect that arises in regard to how and who is *why* practitioners enter an EDR project. The practitioners' driving force to participate in this project was mainly personal pedagogical development. Thus, in addition to EDR acting as a catalyst to engage teachers in research, we recognize EDR as an opportunity to engage teachers in developing new knowledge and as a form of professional lifelong learning, which teachers in fact need to engage in through, for example, further education.

Building on the analysis in this study, we recognize no clear boundaries between theory/practice/professional development; they are entangled. Propelled by the new materialist and arts-based approach applied in this study, this acknowledges that these research perspectives have implications for EDR, and we suggest that this is a main contribution of this study. Using new materialism and ABR contributes in broadening the understandings and practices of EDR. In fact, the entanglements of the design team become visible through the analytical use of the ABR propellers (Østern, 2017) when reading the empirical material and new materialist theory through and with one another (see Figure 4). This knowledge adds to EDR and how design teams are affected and touched by the research

process, and how EDR not only is effective for professional learning and change, but also—and importantly—meaningful, touching, and personally rewarding for the partners involved.

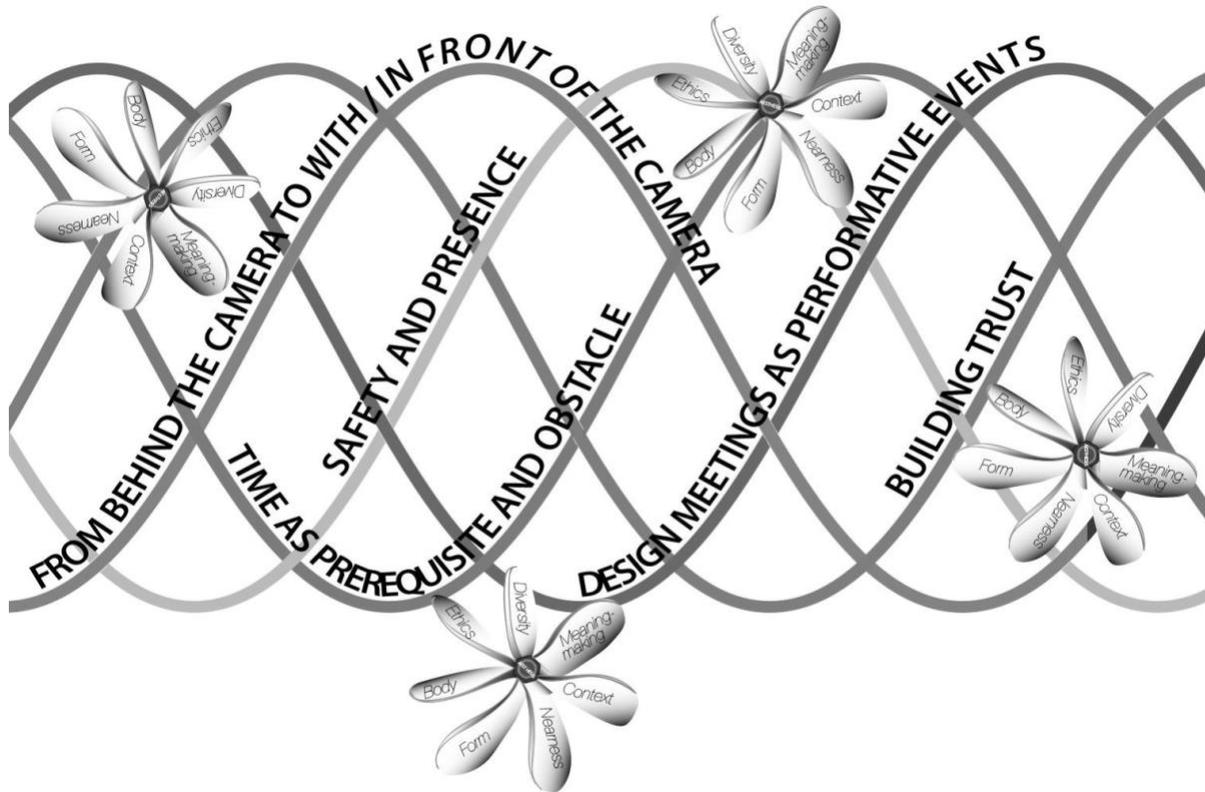


Figure 4. Entanglements of the Design Team Propelled by Østern's (2017) Methodological ABR Propellers (Visual Design: Sofia Jusslin and Mari Ann Letnes).

EDR bridges the gap between research and practice (McKenney & Reeves, 2019; Ormel et al., 2012; Penuel et al., 2015), but new materialism provides a new perspective to EDR by bringing theory/practice as well as researcher/researched together. The partnership formed in design teams conducting design research cannot be separated from the pedagogical realities and knowledge generation because of the intra-action between theory/practice/professional development in the pedagogical environments. Moreover, we chose to view the knowledge generated as *valuable* and *meaningful* instead of useful, which resonates with the ABR strategies applied in this study. Thus, the design team highlights the *artfulness* and *performativity* of the EDR project when developing teaching pedagogies with dance in students' reading and writing processes.

Ultimately, we acknowledge our privileged and powerful roles as researchers when doing this kind of research (Ringrose et al., 2019) and that we are *response-able* (see Barad, 2007) for the analysis made and knowledge generated. There were more entanglements in the design team than what was presented in this study. Here, we chose to present these specific entanglements with differences that made the most difference in the intra-active becomings of the pedagogical realities and the knowledge generation. Exploring the design team in this study contributed in facilitating the challenging research endeavor of conducting EDR, while simultaneously laying a foundation for the design team's continued work in the second research cycle. (Re)considering and (re)thinking *who*, *how*, and *why* in the project, provided us a deeper understanding and respect for the important *what* aspect in EDR; namely, developing valuable knowledge for educational practices.

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About the Authors

Sofia Jusslin (M.Ed.) is Doctoral Candidate in Educational Sciences at Åbo Akademi University, Finland. In her doctoral thesis, she collaborated with a dance teaching artist and two primary school teachers to develop teaching pedagogies that integrate creative dance in literacy education. Her research interests include dance integration and embodied learning in school and teacher education, posthumanist approaches to literacies, and transdisciplinary approaches to dance focusing especially on combining dance and poetry. She is editorial board member of the peer-reviewed publication channel Dance Articulated.

Tone Pernille Østern, with a Doctor of Arts in Dance from the Theatre Academy, University of the Arts Helsinki, is Professor in Arts Education with a focus on Dance at NTNU Norwegian University of Science and Technology. She is active as Artist/Researcher/Teacher, with a special interest in socially engaged (dance) art, dance in dialogue with contemporary contexts, choreographic processes, performative research, and bodily learning. She is Head of Arts, Physical Education and Sports at the Department for Teacher Education at NTNU, supervises master and PhD students in different countries, and is Editor-in-Chief of the peer-reviewed publication channel Dance Articulated.

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