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Designs for Learning: A Research Approach

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Abstract: In this article, we present some core ideas underpinning research that takes a Designs for Learning (DFL) approach guided by theoretical considerations and choices, as well as by practitioners' challenges and inquiries. These choices shape, and are shaped by, DFL's research goals and motives, theoretical orientation, research objectives, questions, and practitioners' participation and ethical considerations. Further, we present and discuss how DFL as a research approach compares to other design-oriented research strategies. Even if a DFL research approach shares several similarities with other approaches of inquiry, we argue that it remains primarily oriented towards knowledge areas that relate to understanding and developing learning and teaching – both in formal education and in informal settings such as museums.

Keywords: *Designs for learning, learning, education, educational design-based research.*

Introduction

In this article, we present and discuss a design-oriented research projects focusing on Designs for Learning (DFL). We discuss its theoretical framework, methodology, research questions, the phenomena in focus, and its effects on the outcome of different studies. We first briefly describe the family of research approaches known as Educational Design Research (EDR), because its research features are similar and can be combined with the DFL approach presented in the article.

EDR can be seen as a 'family' of approaches that all include the term *design* and contribute to educational research (McKenney & Reeves, 2019). EDR has gained much attention over the last couple of years, partly due to the need to improve the practice and formulation of educational policy (Bakker, 2018; Van den Akker et al., 2006). Another reason is the importance of studying learning and teaching in *educational settings* such as the classroom, in contrast to studies done in a more artificial setting constructed by the researcher.

EDR is considered to be an open, interventionist, collaborative, theory-driven, iterative, and context-specific approach (McKenney & Reeves, 2019; Plomp & Nieveen, 2013; Van den Akker et al., 2006). It is *open* because of the transparency of the methodological process and *interventionist* because there are always interventions going on in an educational design research project. Interventions in EDR are process-based, open and not controlled beforehand – as is always the case in randomized, control group experiments. Further, in an EDR approach, the researcher aims to create innovation for education rather than producing and testing a teaching method or material. The researcher is primarily interested in understanding and explaining why and how things work rather than developing so-called best practices or creating evidence for a specific method (Bakker, 2018; McKenney & Reeves, 2019). Practice-based research has similarities to educational design research (Carlgren, 2020), and we see many examples of such research strategies in Scandinavian research. One core aspect in such a research design is the close collaboration between teachers and their practice (Andrée & Eriksson, 2019; Rönnerman, 2011), such as when using lesson studies as a method for collaborating with teachers.

From a broader, international perspective, there has also been increased interest in teachers practice and through research establish best practices, which can be seen in current evidence-based research where policymakers use methods such as randomized controlled trials to research education (e.g., Penuel et al., 2020). Even though EDR offers practice solutions, it is more oriented towards explaining how things work rather than finding solutions to problems formulated by researchers that are not grounded in practice. The interest in understanding educational situations reflects the importance of researching in an authentic setting where the interaction takes place, and the complexity of the setting

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is emphasized instead of studying the phenomenon in isolation. In research processes, the aim, research questions and data collection methods are often decided before the informants are involved. In these cases, the informants in the field have limited possibilities to affect the direction of the research process and its outcomes. When the data have been collected, interpreted, analyzed and published, there is often no practical impact of the research in the field. In contrast, when using design as a research approach, the researcher *and* practitioners in the field are involved in the design process – in other words, they are not only informants. Thus, a design approach emphasizes building collaborative engagements between research and practice (Lehtonen et al., 2019) to contribute both to the research community and to the field of practice in which it takes place (McKenney & Reeves, 2019).

DFL considers theoretical approaches when exploring institutional, social, and individual practices (Selander, 2017). Further, researchers often act as critical friends to the participants in a research setting rather than acting within the practice in focus. In the next section, we will present some core ideas behind researching with a DFL approach and show how theoretical assumptions and methodological processes underpin its research strategies. It reaches research areas of learning and teaching in different educational settings. More broadly, an extensive research field uses strategies connected to EDR, which is often used as an overarching term for several research strategies (Bakker, 2018; McKenney & Reeves, 2019). Therefore, we will describe characteristics of DFL that are part of a wider design research approach. As a point of departure from a DFL approach, it is first and foremost a theoretical approach for analyzing and interpreting multimodal meaning-making and learning processes within organizations, groups, and individuals.

Designs for Learning

DFL is situated at the crossroads of a broader sociological understanding of the conditions for teaching, learning and assessment, and a narrower analysis of communication and knowledge representations in different educational settings (Björklund Boistrup & Selander, 2021). DFL's theoretical grounding is developed from theories about multimodality and social semiotics (Kress, 2010; Kress & Van Leeuwen, 2001; Van Leeuwen, 2005) and from socio-cultural understanding (Säljö, 2014; Vygotsky, 1962). Multimodal social semiotics mostly highlights communicative processes, sign making and meaning-making. Sociocultural theories focus primarily on the institutional framing and the role of artefacts in communication and learning (Säljö, 2014).

The increased use of technology in education has changed how we understand and view learning and teaching. One example of this is the digital technologies that now have an increasingly prominent role in educating children. Endless amounts of information, learning materials, tutorials and courses can now be found by anyone on the internet. Individuals can learn about the climate crisis, the physical world, or how to play the piano without ever being in a physical classroom with a teacher. Traditional education is being challenged because schools are not the only place were learning occurs or where information is stored. However, as we see it, education and teachers are more important than ever, but we need the right tools and theories to understand how to address these new challenges. DFL is a theory that can be used to study new demands on teaching, learning and assessment. Its theoretical framework focuses on sociocultural and interpersonal conditions, as well as individual aspects of learning in different contexts.

Further, the researcher that chooses to use a DFL approach takes an interest in epistemology and focuses on how learners, individually or collectively, design their learning in different situations. The theoretical grounding of DFL is used alongside the research process, from identifying a research problem to the analysis of empirical findings and the representation of results. The areas that are investigated are also influenced by the hermeneutic-interpretive ideal, where social-semiotic perspectives and theories of learning guide the theoretical understanding. The DFL approach emphasizes communication, interaction, and action in different situations (Selander & Kress, 2010; Selander, 2017). Understanding representations of meaning-making is central, and the descriptive and interpretive claims deepen the understanding of what is being studied and provide new reflections and perspectives. DFL is also characterized by an interpretive approach and describes and analyzes details in individuals' or groups' meaning-making processes, and critically reflects, questions, or problematizes the obviousness that emerges in explored situations. The DFL approach can be described as theoretically oriented, where the researcher uses theoretical understanding to frame the inquiry. The inquiry can be grounded in an interest in informal or formal learning settings, as well in challenges or problems of practitioners.

Designs for Learning as a research approach

Here, we present how research is conducted using the DFL approach by highlighting recent examples. To contextualize the description of the research approach, we present four central topics: 1) primary goals and motives, 2) research focus and questions, 3) methodological research actions, and 4) theoretical and practical results and contributions.

Primary goals and motives

In DFL, the primary goals and scientific motives can vary. The research is situated in *natural* education settings, and it explores different interests and learning and teaching. Several types of EDR's research goals have been discussed in the work of others (McKenney & Reeves, 2019; Plomp, 2013; Reeves, 2000) and they are described as descriptive,

interpretive, predictive, developmental, and action-oriented (see McKenney & Reeves, 2019). Researchers using the DFL approach mainly approach descriptive and interpretative goals concerning how learning in a broad range of contexts can be explored. DFL has learning processes as its primary research interest and therefore also an interest in contributing to the discussion about how education can be improved (Selander, 2017).

Research goals and motives are often recognized in situations observed in the field and identified in previous studies. The DFL approach influences the formulation of research questions, and core aspects are framed and operationalized according to the theoretical understanding. The approach is used to explain educational phenomena in which knowledge is gained and developed by studies and to assist the understanding and solving of problems in a specific practice.

A commonly used model in a DFL approach is the Learning Design Sequence (LDS) model (Selander, 2008) (see Figure 1 below). The model is often used as a framework to guide a study in the initial phase of a research project and as an analytic tool to describe empirical material. Ramberg et al. (2013) studied a collaborative design exercise and used the LDS-model to analyze the students' design work to reveal patterns in it. They found that many issues regarding the students' work done in the first transformation unit were not addressed by the reviewers in the second transformation unit. They argue that the LDS model was appropriate for analyzing the students' exercise, which included both formative and summative phases that allowed them to highlight the work in the first unit that was not recognized in the second. Other scholars that have used the LDS-model for analysis include Insulander et al. (2017), Kjällander (2011) and Åkerfeldt (2014).

The model contains the key to understanding the phenomena in focus and how they are interconnected, as shown in the Ramberg et al. (2013) study. As mentioned before, the context and setting are essential to understand and consider when analyzing and interpreting the empirical material.
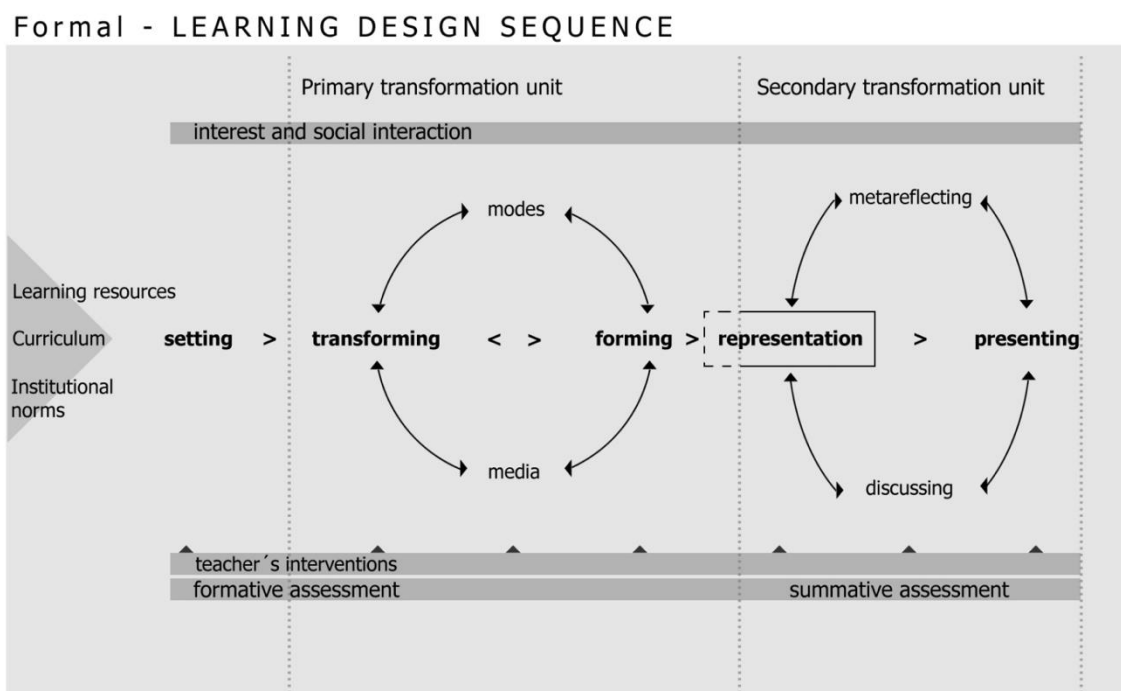

Figure 1. The LDS-model (Selander, 2008).

Further, researchers that use a DFL approach often have a theoretically oriented interest. They use existing theory to gain a theoretical understanding of the object of inquiry. The theory is used either as a fond (frame) for developing theoretical understanding or as operationalized codes to analyze empirical material to better comprehend the phenomenon or problem in focus. Such researchers (e.g., Bergström, 2012; Leijon, 2010) have descriptive and interpretive goals, and mainly focus on portraying specific aspects of learning situations. These descriptions and analytical interpretations are made through theoretical concepts that can be seen as a toolkit provided by the DFL framework and which are put into context in the LDS model. These descriptive and interpretive goals claim to contribute new knowledge to the scientific field and practical solutions to the practical field. These descriptive and interpretive goals attempt to illuminate representations of meaning-making and teachers' or pupils' designs for and in learning or generate descriptive understanding of phenomena related to designs for learning and assessment in teaching environments.

From a DFL perspective, the main interest is to gain knowledge and understand how learning processes can be understood in different settings – not only educational or formal learning settings. For example, Insulander (2010) studied meaning-making in museums as one example of a setting that can be informal or semi-formal. Semi-formal

settings have institutional goals, objectives, and ideas on how they should communicate and educate a wider audience. However, these objectives are more on a local level and not as in education, where goals and objectives are regulated by national curricula.

Learning is understood as a redesign and re-representation of knowledge. It describes a process of transformation and elaboration upon a topic made in a series of sequences by individuals or a group (Selander, 2017). Researchers with descriptive and interpretive goals often seek to understand and improve professional practice by describing and analyzing phenomena related to teaching, learning and assessment in different school systems and educational settings. DFL can also be used as a framework to help professionals construct or elaborate the development of theoretical and practical understanding of specific settings in practice. With the support of theoretical concepts, it is possible to frame, talk about and develop the practice where researchers act as critical friends and contribute to a theoretical understanding (presentation) and discussion of the practice. Through the work, the practitioners were able to change and innovate their practice. The discussions, presentations, and the work with the researchers helped make room for a changed approach to the practice – not necessarily better, but different and innovative.

Research focus and questions

In DFL research, the questions and problems are often rooted in practice and interest in theory development. Describing and understanding questions such as *what*, *how, when,* and *why* things are done in practice or in a specific learning situation requires researchers to gain rich empirical material and access to fields of context. These questions are grounded in didactic science, which is often seen primarily as a teacher-centered discipline, i.e., it focuses on questions related to methods, aims, and content (Meyer, 2007). Through the work of Selander (2017) and Wickman et al. (2018), didactic science is starting to be viewed as a design science.

Research in DFL can be conducted in several ways, and there are different kinds of phenomena and research objects in which researchers take an interest. Leaning is, for example, not only studied in formal school settings but also in different informal and non-formal arenas. However, one could say that the research focus is often oriented towards broad and complex phenomena like communication, representation of knowledge, interaction processes, multimodality, meaning-making and learning, and recognition and assessment of learning. Research questions are usually posed in an explorative manner and focused on understanding the analyses or responses that possible interventions induced. The research purposes are often open and motivated by a concern for 'exploring' or 'understanding' something specific in practice. The questions are formulated as concrete how-questions about meaning, processes, and contexts (cf, Maxwell, 2005). In an EDR approach, intervention is essential. The focus is on designing, testing, and improving. In a DFL approach, intervention can be valuable, but it is not essential.

Still, the research focus is essential when starting a research project. However, as a design researcher, you need to be open and prepare for negotiations and even reformulations of the research questions as the project proceeds. As mentioned, a design research project is not always a linear process, but one that might lead in new directions depending on what happens in the context (also see Bakker, 2018).

The interest is primarily directed towards critical concerns about a practice and how that practice could be developed. It does not need to produce a specific artefact or method (as is the case in design-oriented practices). Furthermore, the research interest is in asking questions about the practice to illuminate, reframe and discuss challenges and questions from several perspectives rather than finding the 'right' solution to an educational problem. By contrast, Bakker (2018) describes two broad types of research question: 1) what characterizes an intervention and its effect, and 2) how particular learning goals can be achieved. For a DFL approach, we would like to add two more questions that relate to the significance of the study: 3) the *why*-aspect and the interpretation of realized effects, patterns of analysis, and consequences in practice, and 4) interpretation in the light of a broader perspective – based not only on the specific context being studied. In the table below, we illustrate some common research objectives and research questions.

Table 1. Examples of research focus and research questions.

Research focus	Research questions
Transformation Multimodality Meaning-Making	How do teachers and students transform educational objectives within an LDS model? How is multimodal meaning-making represented in two different classrooms?
Meaning Representation	What meanings are made by the students in the two groups? How and when do students realize a multimodal representation of the subject?
Signs of Learning Recognition	What the teacher recognizes signs of learning? Why are assured signs of learning recognized as legitimate knowledge by the teachers and the school system?

Methodological Research Actions

The methodological research actions in DFL are similar to general educational research strategies and some of the approaches within the family of EDR. As with several research approaches, the DFL approach can be defined as a non-linear process where the researcher produces explorative work, constructing empirical material and analysis as part of a circular and iterative processes in collaboration with other researchers and practitioners in the field. Collaboration between researchers and practitioners brings many opportunities, such as identifying educational problems together and formulating inside and outside (etic and emic) perspectives on problems that need to be solved. Research actions are mostly collaborative exploring, using mixed methods, iterative processes when constructing empirical material, and theoretical microanalysis within multiple activities.

The collaboration between practitioners and researchers can take a different form and vary in the degree of involvement, which can range from formulating a problem-based practice to designing a study where the practitioners are involved the whole way, or from formulating a research question to reporting about the project in publications. One example of the involvement of practitioners at the beginning of a project can be seen in a study done by Svärdemo Åberg and Åkerfeldt (2017; see also Svärdemo Åberg et al., 2013), which examined how students' multimodal representations were assessed by their teacher. The research was grounded in a project that studied the implementation of a one-to-one educational setting (Åkerfeldt et al., 2013). In the project, the participating teachers had difficulties assessing students' multimodal representations that were produced in the setting where every student had their device. Svärdemo Åberg and Åkerfeldt (2017) used a mixed-method approach to understand how the students used multimodal texts and how their teachers perceived and recognized the multimodal texts which were produced in the project assignments. The methods used in the study were observations, analysis of the students' work, and interviews with the students and teachers.

At the beginning of any DFL research project, it is essential to initially orient the phenomena or research problem in its milieu. As in other design research, researchers within DFL start the research by identifying the problem in collaboration with other researchers and practitioners. Together, they discuss factors that need to be understood in order to address the research problem. This first discussion leads to an analysis that is often formulated in a draft or synopsis of the problems. The initial questions are: What do we know about the problem, practitioners, or possible informants? What do we know about the context and previous research about the specific problem?

If there is limited knowledge about these topics, the purpose is to acquire as much knowledge about the problem before the study is carried out. In these collaborative situations, issues and challenges regarding the educational context, material context, ethics and methods are discussed and documented by the researchers. Further, this initial orientation helps the researchers and practitioners identify characteristics of the educational setting, informants, possible interventions, attitudes about possibilities, and obstacles already known by the practitioners. Mixed methods are often used in EDR (Lehtonen et al., 2019) and DFL. A variety of methods is often used when collecting empirical material such as participatory observation, formal and informal interviews, and artefacts (e.g., documents). However, the most usual method in DFL is observation and video documentation, where the material is analyzed through detailed multimodal transcriptions. The researcher even engages in field-based investigation and explores the problem by doing careful participatory observation, listening, video documentation, interviews, and document studies. The researcher often uses these methods in a flexible and iterative way throughout the research process. Here, we present some core phases or cycles, where each phase consists of iterations due to insights or problems that need to be scrutinized and further developed.
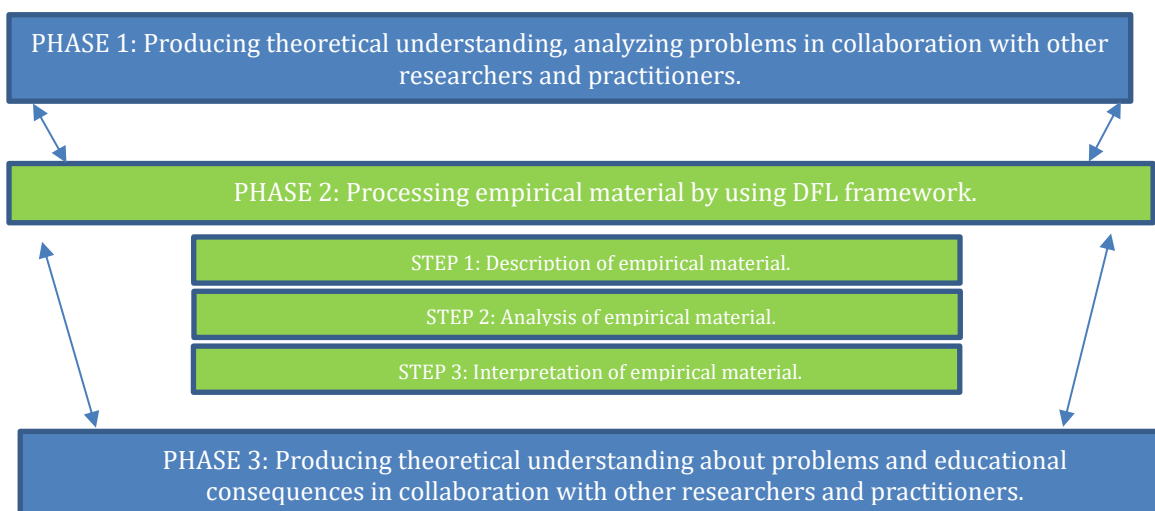

Figure 2. Phases in the research process.

The phases are illustrated in Figure 2. Green indicates that the researcher has a more prominent role, and blue indicates both the practitioners, and the researcher are involved. These phases are not to be seen as separate or linear, as in a DFL approach the researchers go back and forth between the different phases, which is indicated by the arrows on Figure 2.

The degree of involvement from the practitioners can vary depending on the purpose of the study. An example of a low degree or indirect involvement from practitioners can be seen in Svärdemo Åberg and Åkerfeldt (2017), where the research aims, and questions were mainly designed and scrutinized by the researchers.

In the second phase, the empirical material is constructed and processed by the researcher and theoretical framing is used for analysis and interpretation. The process of constructing, analyzing and interpreting the empirical material is divided, with these different steps occurring in sequence. However, this process should be seen as circular because the researcher usually goes back and forth iteratively to clarify, repeat, and sharpen their observations. The analysis is abductive, where the theory and empirical material are viewed repeatedly. The theory is 'put in play' rather than being a static background, and it is developed throughout the research process. Further, as this work is dynamic, theories from other disciplines are often used to better understand the studied phenomena. The researchers analyze and interpret the empirical material, and this can even be done in collaboration with practitioners.

The last phase relates to reconnecting with the practice and the interpretation of the empirical material. The results are seen in the light of their consequences for learning and teaching, focusing on both the practice and the research communities.

Theoretical and practical contributions

Theories are used differently in various disciplines and can also mean different things. Each theory is based on certain basic assumptions about the phenomenon in focus and has a specific range and explanatory value. Each offers limitations on how properties or aspects within the phenomenon can be connected. Theories do not claim to explain everything and have a specific scope. They consist of related concepts, which can be seen as building blocks that structure and organize explanations and the interrelations between the core aspects of various phenomena within the social world. This means that theories about, e.g., learning may differ, and these different explanations are not always helpful in getting answers to the questions that are posed. Theories are related to real educational problems, and they are developed from studies where the knowledge domain is developed over time. In education, theories about learning are extensive, multifaceted, and often spring from related domains such as psychology, sociology, linguistics, philosophy, and human-computer interaction, to mention a few. As stated above, the DFL approach is at the crossroads between sociocultural theories and social semiotic theories. From these perspectives, students' learning processes are continuously situated in a social and cultural context. Learning is seen as a design process of semiotic transformation and formation by the students in different activities (Selander, 2008). By highlighting and bringing attention to learning as a design process, the attention shifts from learning as a "… context-free and mental collection of 'facts'" (Selander, 2017, p.17) to learning as an act of transforming and forming activities in social practice. Further, a central assumption is that social practice is not solely shaped by verbal or written language. Images, colors, and sounds are also essential resources for communication and learning. In the learning process, individuals use and give shape to their interests by using different resources allocated to them, e.g., by teachers. These resources are *representations of knowledge*, and they are always connected to a social and cultural domain (Bezemer & Kress, 2008; Selander, 2008). In turn, different representations of knowledge have various qualities that lead to certain aspects of the content being highlighted, while others fade into the background (Kress & Selander, 2012; Svärdemo Åberg & Åkerfeldt, 2017). The social context, students' interests, and the qualities of the resources are interconnected and must be analytically addressed to understand learning processes. However, these aspects are broad areas and do not necessarily have to be foregrounded in the same study.

So-called design principles are an essential outcome of an EDR approach, as are conjecture mapping and hypothetical learning trajectories, which form the bridge between educational theory and practice. It is what Bakker (2018) calls 'advisory knowledge', by which he means that "Design researchers seek actionable knowledge and theories of action. They aim to yield useful knowledge (tied to design) that is sensitive to context and yet general enough to use in new situations" (p. 47).

Challenges, opportunities, and ethical considerations

In this paper, we have presented and discussed core ideas that are relevant when using DFL as a research strategy. The focus has been on four central topics: 1) primary goals and motives, 2) research focus and questions, 3) methodological research actions, and 4) theoretical and practical results and contributions. Below, we discuss these topics with a focus on challenges and opportunities, as well as ethical considerations.

One key challenge when using the DFL approach is the massive amount of empirical material it generates. While this can increase the validity, it can also, as Lehtonen et al. (2019) point out, lead to unsatisfactory results. Further, it may be impossible to do the same study again and obtain the same result. Instead, the knowledge interest in DFL centers on particularities and significant aspects in the learning process where the theoretical understanding can serve as an analytical generalization. Dede (2004) points out that a researcher who uses a design research approach often lacks in-

depth theories and therefore cannot contribute to theory development (Lehtonen et al., 2019). There is also an ethical challenge as practitioners (teachers, school leaders, students) are both involved in the research and entwined in the process. In turn, this can lead to criticism of the study as it might be challenging to create a separation from the practice that is being studied and developed. Using the DFL approach could be a way to address the challenge pointed out by Lehtonen et al. (2019), as well as the ethical challenges of participation. Both these challenges could be addressed using theory to create a distance and an understanding about each other's roles as we illustrated in the phases (see Figure 2). However, as we address further below, the DFL approach is still new and needs further development. Another challenge that Lehtonen et al. (2019) highlight is that EDR is costly and demanding when it comes to resources. It is vital that the 'right' solution is found to this problem. EDR has been criticized for its lack of transparency when it comes to research methodologies (Kennedy-Clark, 2013) and its lack of theoretical framework (Lehtonen et al., 2019).

Even though challenges exist and need to be addressed, we see that using design as a research strategy is a valid approach to educational research. There are three main arguments we advance to support this claim: 1) the field of education is multidisciplinary, 2) the complexity of the practice, and 3) the gap between educational research and practice must be narrowed. When using a DFL approach, the researcher's role is not to tell practitioners how to act in their profession or how to teach in their classroom. The complexity of the practice needs to be understood and respected. In a sense, the contribution of research to the profession is not guidelines of 'best practice'. What defines best practice must be decided by the teachers and school leaders in their social practice, not by the researcher. McKenney and Reeves (2019) note that case-to-case generalizations or analytical generalizations seem to be particularly useful in EDR, and so they are for DFL. The researcher often interprets and generalizes specific results for a broader understanding of theory and other relevant research.

Universities worldwide are establishing a relatively rigid ethical protocol that needs to be approved by an ethics committee before the researcher gains access to the field. This procedure ensures that the researcher has thought about and addressed all ethical considerations, which is essential. However, these procedures are often designed to fit research in medical or natural science, which can be problematic for a design research approach. Standard ethical protocols often build on traditional educational research methodology. Often in a standard ethical protocol, the researcher must state their research questions before starting the research process or making contact with the practitioner. In the majority of ethical protocols, the questions asked are mostly about the beginning of the research process and how the researcher obtains consent, how it is stored, and who has access to it. There are few questions about how the researcher will conduct the research itself. When working closely with practitioners, these issues are usually in the background, but they are very much in the foreground for the researcher using a design approach. For example, questions such as: What is the nature of the power relations between the researcher and the practitioner? When researching in collaboration with the practitioner, can the practice be criticized, and if so, in what way?

Over the years, collaboration with informants has taken on a greater importance. This shift has led to talk about informants as actual participants. From an EDR perspective, the researcher and participants are entangled, which means that a critical principle in design research is *collaboration*. Collaboration is also one of the elements put forward by Penuel et al. (2020) that connect four design research strategies†. This shared commitment to conducting research where the inquiry is collaborative and views the participants as partners, signals equal involvement in the research. A strong emphasis is on the participants' agency, and the focus is not to 'study them.' The participants are highly involved, and solutions are created *with them* instead of *for them* (Penuel et al., 2020). This calls for ethical considerations such as transparency, which explicitly states what expertise the participants contributed in the inquiries, the research process, and the outcome (Penuel et al., 2020).

Barab and Squire (2004) argue, "[...] if a researcher is intimately involved in the conceptualization, design, development, implementation, and re-searching of a pedagogical approach, then ensuring that researchers can make credible and trustworthy assertions is a challenge" (p. 10). It can become a challenge for the researcher, as the most active part in the research process, such as in identifying research questions and designing the research and, at the same time, have a critical perspective on the practice. For example, researchers have to describe how they have met ethical requirements before entering the field. Ethical requirements are important and essential to consider beforehand. However, this also means that the researchers alone design the research, which decreases the involvement of participants within the practice and thus breaks a core principle of the design research approach.

Conclusions and Limitations

The goal of using a DFL approach is not to develop a quick way of solving a problem or measuring an innovation, but to understand a learning situation or process in, for example, a classroom or an online learning community. It is important to reflect upon the consequences that emerge in these situations and contribute to theoretical understanding, which can

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† Penuel et al. (2020) reviewed four approaches: 1) The Strategic Education Research Partnership Approach Initiated 2) Design-Based Implementation Research 3) Improvement Science in Networked Improvement Communities and 4) Community-Based Design Research.

also be used to underpin further design studies and support practitioners' professional development. The main aim is to understand learning and teaching in natural social conditions.

The Designs for Learning (DFL) approach is a relatively new research approach and has so far mostly been used in Scandinavia. Therefore, more studies are needed to widen the body of knowledge. As we see it, DFL is a part of the EDR family. DFL offers a theoretical basis for teaching and learning where the methodology of EDR is compatible. A researcher could either be using DFL as a research strategy (Figure 2) or as a theoretical approach with an epistemological commitment compatible with many of the research strategies in EDR. This is also needed when education and learning are central to fostering lifelong learning and bridging the gap between research and practice.

Authorship Contribution Statement

Åkerfeldt: Concept and design, writing, admin, critical revision of manuscript. Svärdemo Åberg: Concept and design, writing, critical revision of manuscript.

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