Design and research

Ethical considerations

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Introduction

A Designs for Learning perspective, with its close attention to the setting and the materiality of communications, is well-suited for research closely connected to the actions taken by professionals and participants. This may be research *on* others, where the interest is to understand how learning is supported and/or limited in a certain context, while also considering the complexities of that context. There may also be research *with* others, where the emphasis is on making changes in practices while investigating these changes, where researchers, professionals, and other participants collaborate. In such collaborations professionals may, for example, be working in schools as teachers and school leaders (i.e., in formal settings), or as staff working in semi-formal settings such as museums (see Chapter 8 by Insulander & Öhman in this volume). Here, we discuss both design research *on* others and *with* others, with specific attention given to ethical considerations and aspects.

In this chapter we discuss ethical considerations, following the LDS model (Figure 4.1) from left to right; starting with the setting, which is framed by the resources at hand, and the institutional norms and regulations. This section is followed by ethical considerations in relation to the transformation units where interactions take place in different kinds of situations, constituted by transformations within and transductions between modes (e.g., pictures, body movements, speech). After this we address ethical considerations concerning participants' roles vis-à-vis a Designs for Learning framework.

The setting

When working with research that involves human beings, there are several ethical issues that need to be addressed and accounted for in different stages in the research process. As part of the setting for the research, *institutional regulations* are to be followed and, in many cases, there is also a need for formal ethical approval of the project. It is also the case that participants must be informed, and that they have an opportunity to ask questions, as well as being required to

Figure 4.1 Formal Learning Design Sequence.

sign a document (or to be informed verbally, depending on the research setting) where they state that they accept that a certain generation of empirical material¹ is taking place. However, researchers also need to consider non-formalized, ethical questions concerning their relationship to others (e.g., unequal power relationships) and possible consequences of the research.

Formal ethical protocols—an obstacle or a necessity?

Currently, increased attention is on ethical considerations for research, where formal research approval is needed before a project begins generating empirical material. The main purpose of this is to ensure that the research is not harmful to participants, while at the same time ensuring the quality of the research. In the following we will elaborate on, and problematize, the processes around these regulations, not least in relation to research carried out together with professionals. However, even though ethical approvals are highly regulated, they differ between contexts, as they do between universities. This could mean that in one context a research project which does not include individuals' feelings and other information which might be sensitive, needs to submit a formal, and costly, ethics application to an external board, where the plan of the project is clearly articulated including empirical data and ethical considerations, whereas in another context the same project would only need a minor ethical check at the local level with, for example, a research board.

Ethical considerations also create opportunities for the researcher to reflect in depth on these before the research project starts. For example, as described

by Selander in Chapter 1 in this volume, research in line with DFL has an interest in learning, constituted by a broad range of modes, and strongly connected to the design of the setting where humans are interacting with each other. In that sense, research in line with DFL is classified as social science research. Here we can see a tension between research in this domain and research in the domains of the natural sciences, since ethical review boards often base their understanding of regulations from declarations made within natural science research; for example, the Helsinki declaration,² the Australian NHMRC,³ or, in the UK, ethical guidance documents from BERA⁴ with ethical guidelines for educational research. The consequence is that for research in line with DFL, there is a need to adjust the narrative of the project to fit the application of ethical approval, with underlying assumptions derived from natural science research. In the following, we will examine this standpoint a little further.

In research where design approaches like DFL are adopted, there is an increased interest to work *with* participants in their practice rather than being the outsider doing research *on* others (which is mainly about collecting data from the site of the practice, then returning to the university to analyze and ultimately report on the findings in a scientific publication). For example, when carrying out research with others, one important aspect is to involve the participants in the research process since the research has its focus on the development of the practice, while simultaneously studying it. In both developing the practice and doing research on data deriving from this, researchers and professionals are each necessarily involved in a mutual, changing and dialogic process. This entails that the research project must consider the setting, not only at the beginning of the project while planning it, but also where and when the project actually takes place. This, in turn, means that there may be changes that can take a different turn from what was planned, in a way that the researchers had not foreseen when applying for ethical approval. In that sense, the standard ethical protocol required by the authority presents a challenge for researchers who wish to use a design-oriented research approach, not least because it builds upon models designed primarily for medical and natural science studies.

Of course, it is relevant to address and think about issues regarding ethical requirements beforehand, but this also means that it is often, of necessity, the researchers alone who design and make decisions regarding the research. This is likely to decrease the engagement enrolment of the participants in the practice. Should a project need to be modified, one consequence might be that the researcher would need to adjust the project to the plan, and to submit another application for ethical approval. This would normally be time-consuming (and expensive) and often requires the project to be on hold during the period the new application is processed. As we see it, this question goes beyond technical and practical issues. Rather, it has to do with a democratization of research, in line with Wood (2017) who argues:

[G]iven the calls for universities to decolonise and democratise research, we need to question whether the ethical norms developed to cater for objective, researcher-driven enquiries are appropriate and sufficient to ensure ethical conduct for qualitative designs that are more subjective, participatory, and community-based.

(Wood, 2017, p. 1)

Ethical protocols and participants in the research

One ethical challenge for research in line with a Design for Learning perspective is that the research, and consequently ethical approvals, often need to take into consideration video data as a *resource* for the analysis. The reason for this is that the DFL perspective views all kinds of modes as valuable to consider (see Selander, Chapter 1 in this volume), when exploring situations where learning is taking place.

Some research inquiries with a focus on exploring classroom interaction which includes speech as well as gestures, for example, would not really be possible if multimodal data and analysis were not part of the project. An example of this is Boistrup's (2015) research, where feedback as part of classroom communication often included facial expressions and body posture. If only sound had been recorded, the findings would have been substantially different, missing out on feedback acts taking place on a day-to-day basis in mathematics classrooms; for example when the teacher has a concerned facial expression, indicating that something might be wrong with an answer. Another example is in the research by Åkerfeldt (2014), where video data was supplemented with recordings of computer screen activities. The screen recordings made it possible to do an in-depth analysis of the writing process using the resource of word-processing software. Here also the multimodal analysis was essential so that the students' writing, editing, and pauses could be followed at a micro level and then compared to their writing with the resources of pen-and-paper. This is further elaborated in the section on Transformation units.

When the empirical material includes video-data and photographs of people, extensive additional work to gain ethical approval might be needed, not least since the rationale for ethical regulations stems from the field of natural science, as stated above. Another challenge is that it might be harder to get participants (e.g. teachers and students) to be willing to take part in the research for reasons of privacy. Previously, before the possibilities for video-data to be published and easily disseminated (e.g., through YouTube, Vimeo, or other cloud-based services), and there was no software allowing for facial recognition, this was not such a big issue. Simultaneously, this development has led to more caution in the field and by professionals, which of course can be viewed positively, since it points towards an increased awareness about recorded digital material. So, there is a tension between, on one hand, empirical material that could include video data (often needed to get a full picture of the on-going communications), and

on the other hand, hesitation by participants (and guardians) to sign a letter of consent agreeing to take part in the research.

However, there are ways to counter this challenge. In relation to participants, one way to solve the tension is for the researcher to work on building trust prior to the research process (Nzinga et al., 2018). For example, in a school setting on some occasions the researcher may meet with the teachers and students first. If this is done, our experience is that both teachers and students become more comfortable with and positive towards video recordings and agree to participate in the research. In this process, it is of course also important to reflect upon and talk with the participant, so if there were any reason for them to leave the project and not be captured in any recordings, they would be able to communicate this without any problem. A multimodal understanding could also be relevant here, so that the participants are informed that they could use different communicative ways to indicate their unwillingness to participate, not just verbally. For instance, they could hold up a hand or shake their head. Another question is whether it is essential for the aim of the study to capture, for example, facial expressions, or not. In the research by Boistrup (2015), it was essential to also record the participants' faces, since, in this case, feedback from the teacher to students was conveyed through facial expressions, speech, and body movements, and also in writing. In the study by Åkerfeldt (2014), the research interest was on the participants' writing using the different resources at hand—in this case it was not essential to capture facial expressions; the activities on the computer screen and observations of how the students moved their hands were sufficient.

When using a design approach in research with professionals, the researcher needs to address the ethical issues at every step of the project, and not only at the beginning when filling out an ethical consent approval. We address some of these in the following sections.

Capturing the institutional setting of the participants' context

Earlier in this chapter, we addressed the ethical issues concerning the setting of the research project. There are also ethical aspects to address when taking the institutional setting of the participants' context into account, not least since institutional norms and regulations permeate the day-to-day practices within that context. The main idea here is to view the professionals in their context as part of, and affected by, the broader institutional context. In this way, the analysis involves the broader complexities of a setting, instead of solely focussing on, for example, how the individual professional manages a situation. One example is a study by Svärde Åberg and Åkerfeldt (2017), where analysis of students' multimodal texts was interpreted in the light of the students' social and institutional use of resources and a recognition of their knowledge through their use of different modes. In Boistrup (2015, 2017), feedback and assessment practices

in mathematics classrooms were connected with institutional traces, including decisions made at the municipality and school levels affecting the classroom work. The institution was part of the setting in other ways such as through available resources, including manipulatives for mathematical explorations, and the national curriculum. The ethical aspects here concern the researcher taking this fuller setting of the participants into account, giving credit to the professionals for the complexities of the work they carry out. This makes it possible to widen the perspectives sometimes displayed in media, or by politicians, where school teachers appear to be the only ones who should bear the brunt of all kinds of criticism of school education.

The same considerations also apply to research carried out together *with* professionals. In such collaborations, there is the possibility to bring in the institutional setting as part of the discussions within the research group. Such discussions are summarized in Boistrup (2017), where teachers mention other actors who may support and enable developmental work in the teaching. For instance, there are many school leaders who are supportive, but there are also examples of the opposite. In the case of resources as part of the setting, teachers pointed at the new national curriculum as being supportive, while the new assessment system was described as taking too much of the teachers' time.

Transformation units

In this section we address both transformation units of the LDS model, where the primary unit reflects interactions during group and/or independent activities such as when students are working on an assignment given by the teacher. The secondary transformation unit has its focus on interactions that normally take place at the end of an activity, or period, where the whole group is gathered, and where the activities in the primary unit are discussed and reflected upon. We discuss both transformation units simultaneously, while there are other chapters in this volume where these units are addressed separately (see Chapter 5 by Boistrup & Hällback, and Chapter 6 by Kjällander).

As mentioned above, a broad range of modes are taken into consideration in DFL research. When the researcher is an observer to interactions in transformation units and generating data which then are analyzed by the same researcher, there are different ways to include a multiplicity of modes. In the field of mathematics education, as an example, it is not uncommon for accounts from classroom activities to focus on what is being said, while other modes are brought in only when needed for a deeper understanding of what is taking place in the communication (see Boistrup, 2018). However, such an approach may at the same time miss essential parts of the communication, and consequently traces of relevant meaning-making activities.

In the first transformation unit, episodes of interactions often start with gazes and movements, such as when a teacher is watching students who are working on an assignment and then, as a next step, decides to approach them

and engage verbally with them. Additionally, in both the first and secondary transformation units, students may present their work to peers who may react by way of body movements and/or facial expressions. These non-verbal modes constitute much of the classroom communication (see e.g. Boistrup, 2015; Svärden Åberg & Åkerfeldt, 2017).

There are different ways for research to acknowledge the multimodal aspects of interactions. Examples from the field of mathematics education include research which pays attention to a certain mode, like gestures and the roles they play in classroom communication (e.g., Morgan & Alshwaikh, 2012), or research which addresses communication inside and outside of school, as constituted by a broad range of modes, with an interest in the functions of these modes (Boistrup, 2015; O'Halloran, 2000). Such approaches are in line with DFL, and the considerations of how to include modes in research are strongly connected to ethics. For example, if one mode, such as speech, takes precedence over all others, the participants' acts could be interpreted in a more restricted way than might otherwise be the case.

The examples in the sections above relate to research that identifies how feedback acts in classrooms could be clearly captured when body movements and facial expressions are included along with words and symbols. Another example is the research by Nordin and Boistrup (2018) accounting for how young students' mathematical argumentations were construed from students describing their problem-solving in a variety of multimodal complexes (Kress, 2017), where one student mainly used drawings, while another used mainly symbols and speech. The aforementioned research provides examples of how such considerations *vis-à-vis* modes provide rich opportunities to do justice to the participants in complex situations such as classroom communication.

The examples above used a broad range of modes in their empirical research, which could also have ethical implications, as noted above. However, this does not mean that the most ethical approach is to capture all possible modes all the time, in every project. On the contrary, we view it as essential from an ethical perspective to reflect upon which modes should be included in the empirical material, and why. As an example, in the aforementioned research by Åkerfeldt (2014) which focussed on the writing processes, video recordings took place alongside the recordings of computer screen activities. However, the faces of the participants were not captured since they were not essential in relation to the research questions of the study. So, from an ethical point of view, it is essential that the empirical material should, wherever possible, also be part of the analysis. If not, we as researchers have intruded into the participants' lives without honouring that hospitality. It would be even worse in the case where participants were not fully informed about the researcher's intentions.

What we have emphasized above is equally relevant to research carried out together with professionals, for example, in action research. One major difference is that the decisions on what data to collect, and why, are decided jointly by researchers and professionals. However, the different

areas of expertise in the research team can be beneficial. The professionals are the experts in the research setting with its contextual factors, including how video recordings might affect the participants, for example. Such knowledge is helpful in making ethically grounded decisions on how, why, and when to collect certain data. The researchers are the experts in ethical guidelines and should pay attention to the aspects described above and take the kind of responsibility that lies with their role. In sum, in collaborative research between researchers and professionals, both parties should be involved in the reflections concerning the ethics of the research, but it is the researcher who is responsible for both how this is done and how the results are presented (which includes checking with the professionals for accuracy or refinements, etc.).

Our examples in this section have so far been connected to classroom activities. There are of course examples of research in other kinds of settings, and consequently with other kinds of content-oriented transformation units. Here we connect to some of the chapters in this volume which do not address ethical considerations *per se*, but which are possible to construe. In Chapter 8 by Insulander and Öhman, museum educators collaborated with teachers and researchers. This means that the setting was mainly semi-formal, which was made clear when the activities in the workshops on programming were described as both entertainment and education. An ethical aspect here was how the authors brought in the framing of activities at both the museum and the school as part of their analysis of what was taking place in the transformation units—for example, how an “exhibit or a workshop at the museum will be designed differently from a textbook or a lesson in school, depending on different expectations and purposes” (p. xx). Another example from this volume is Chapter 6 by Kjällander, where the interactions between educators and researchers during a development project are discussed. Through the description, which followed the LDS model, reflections took place throughout the project which was planned so that it would be owned equally by educators and teachers. Essentially this was about the roles that different participants would take and have the opportunity to take. This will be discussed in the next section.

Professionals’ and researchers’ roles

An important issue in education (and other) research is the role of the researcher and the importance of not compromising the researcher’s integrity. Distancing themselves from the field and the individuals involved in project are often mentioned as important aspects of the research. This distance is (mostly) a protection against bias and particularity (Penuel et al., 2020). However, over the years, there has been a development towards recognizing the importance of collaboration with the informants. In turn, this shift has led to referring to informants as participants in order to emphasize the collaboration which is an important principle in design research.

Principles for roles in research where participants are taken as partners

Collaboration—where there is a shared commitment to conducting the research—is also one of the elements put forward by Penuel et al. (2020), where the collaborative partners have an equal (but not necessarily the same) involvement in the research process as well as in the co-design of solutions to specific problems. They investigated four design research approaches⁵ and identified eight interconnected principles: the first principles state that the participants' involvement should entail that the solutions created are *with them* instead of *for them* (Penuel et al., 2020). The second principle highlights the roles of the participants in the sense of clearly defining and describing the roles of all partners involved. Included here is the acknowledgement of professionals' expertise, which includes making it clear how that expertise was part of (and integrated into) the research. For example, statements of contribution from the different stakeholders are seen as important. It is likewise important to make material from the project available to all participants, including making adaptations when appropriate to their current workplace situation. These principles could enable design research to address criticisms about bias and particularity.

These considerations call for ethical reflections such as transparency in the research project which explicitly states what expertise the participants have contributed to the research project. Regarding the outcome, the professionals could be involved as authors of publications from the research project (see, e.g., Chapter 5 by Boistrup & Hällback, this volume).

Collaboration with professionals

As noted above, from a DFL perspective the research is often done *with* and not *on* the professionals, which means that collaboration is a crucial ingredient in the research process. Involving professionals within a research project can be done in several different ways, from the researcher collaborating with professionals, for example, acting as a critical friend, to a more intense involvement, as mentioned above, where the participant becomes a co-author of a scientific article (Sydow et al., 2021). This raises several different questions regarding the researcher's and the professionals' respective roles. One question concerns the trustworthiness and credibility of the results from the study, for example, when the professionals are highly involved in the research process (e.g., Barab & Squire, 2004) (for reasons discussed below). Also, in cases where the researcher has an active part in the practice, one can ask if—and how—the researchers themselves can maintain a distance and ask critical questions as well as critically discuss the results from the study. Likewise, how can a professional portray and describe the practice without these being coloured by the situation, the circumstances, and their previous experience of the context (e.g., the school

and the pupils)? The simple answer is that they cannot. Neither the researchers nor the professionals can detach themselves from their experience and prior understanding of their practice. However, in design-oriented research we would argue that this is a strength and not a weakness or a problem. The reason is that researchers and professionals gain knowledge by working *with* the practice instead of only studying it. Using this knowledge opens up opportunities for broadening the analysis and considering the lived experience in relation to the institutional norms and regulations.

By this, we do not say that it is easy to work with the practice as there are challenges on different institutional levels when it comes to ethical approval (see the section above on the setting of the research) as well as in relation to project descriptions and, for example, transparency when it comes to scientific publications. Let us mention one example. In a study by Sydow et al. (2021), a researcher attended workshops that were held by another person who was the project leader. The role of the researcher was to act as a critical friend in these workshops, and this was introduced and stated in each workshop. Beside observing and following the workshop, the researcher was involved by posing questions and discussing issues that were raised in the group. The researcher took the lead and was responsible for the analysis of the empirical material. In the writing process there were specific roles, where the project leader had a more prominent role in describing the context of the study, while the researcher had a prominent role in writing up the results and discussion. The project leader (the third author of the article) was an important bridge and link to the professionals, and during the writing of the article was involved in several discussions which took place about the analysis of the material, giving insights about both the professionals' contexts and the institutional framings. Being a researcher and taking an active part in the field, such as being involved in the planning and teaching while at the same time having a critical perspective on the practice, can be questioned. Therefore, the issue of transparency regarding how the study is conducted, including critical questions, needs to be raised and discussed. As pointed out above, gaining insights into the practice, for example, can be valuable. Before entering a collaboration with professionals, the following questions may be useful as a guide:

- How do you address the power relation between the researcher and the professional?
- How can participants' different challenges and questions be taken care of?
- When doing research with professionals, how can the practice be critically examined?

Discussion

In this chapter we have discussed ethical considerations with a focus on standard ethical protocols often built on natural science research and its methodology,

aspects related to the institutional framing of the teaching, and the roles that researcher(s) and participants (e.g., teachers and students) may play during the research. We have used the LDS model to structure and pinpoint, as we see it, some of the most challenging ethical aspects when conducting research using a DFL framework. In this section we will broaden the perspective to include a wider context as well as looking forward, and highlight some aspects that will be crucial to address in the future.

As described above, in an application for ethical approval the researcher must state their research questions before entering or contacting the field, and if this process changes the researcher's aim or questions, the researcher will then need to change their application and seek a new approval. These demands are in conflict if the researcher uses a design-based approach to the field when collaborating with professionals, as this approach builds upon professionals' inquiry rather than pre-formulated inquiries from researchers. We argue that the latter creates a gap between research and practice. Another gap could occur when findings from education research studies are mostly intended to be communicated within a research community rather than the community of the professional. Penuel et al. (2020) argue that these matters are important and that there is evidence that a design research approach in education can, when taking ethical considerations seriously, promote agency and equity in education. Wood (2017) uses the term "community research design" to indicate that it is a political stance to include and involve participants in studies, instead of "doing research 'on' them and reporting findings 'about' the issues they face" (p. 1). This calls for a change in the standard ethical approval process and we argue that this way of conducting research is a way forward in addressing professionals' challenges in real settings where there is a partnership between professionals and researchers.

We have also discussed the roles of researchers and professionals in terms of research integrity. Even though it is challenging and time consuming, we need to consider and work towards a sustainable partnership between actors in a research project. Here the researcher has a responsibility, when possible, together with professionals, to communicate research results to the research community as well as to the community of professionals. Further, we have emphasized and discussed the importance of including a wider context such as the setting in which the teaching and learning occur. This could include, for example, a policy document, regulations, or institutional framings that have an impact on classroom interactions.

In this chapter we have put forward and discussed critical issues of ethical considerations in relation to research in line with Designs for Learning. Simultaneously, we have left some issues in the background. One such issue is ownership of the empirical material constructed in a research project. As professionals and researchers enter a partnership there needs to be an agreement or a common understanding of how the empirical materials are allowed to be used, shared, and stored. Some of these issues are regulated in the ethical approval, however as

the research process is dynamic and changes over time it needs to be discussed at all stages throughout the research process. Further, as technologies develop, new possibilities are emerging which can be used for constructing empirical material. Why, when, and how these can be used also need ethical considerations. One such area, vividly discussed in education both by researchers and professionals, is the use of artificial intelligence where there are ethical concerns such as knowing how the algorithms work and which data are used to feed the algorithms. Lack of knowledge of the data used and how it will be analyzed by AI might lead researchers or professionals to make the wrong decisions. Another issue related to the vast growth in technological development is the possibility to capture and follow students' learning processes using multiple data sources. Multimodal data, which from this perspective means empirical material collected from multiple data sources, is often used to understand a phenomenon. The ethical aspect that arises in this context is that the individuals might feel as if they are under surveillance all the time, and it might not be obvious to them that data is collected automatically when the empirical material is being constructed as part of computer activities. New technologies bring forth opportunities as well as challenges and one way to move forward is to discuss ethical aspects before but also during the research process.

Notes

- 1 We want to avoid the term "data collection" since it is not coherent with collaborative research, where data is said to be generated with participants.
- 2 www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/
- 3 www.nhmrc.gov.au/research-policy/ethics-and-integrity
- 4 www.bera.ac.uk/resources/all-publications/resources-for-researchers
- 5 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.

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