

# **Actor-Network theory and a methodology for inquiring the online/offline of education**

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Actor-Network Theory, Ethnography, Digital dualism, Sociomateriality, Post-humanism, Educational practice

## **Abstract**

The paper explores what the methodological considerations are for a study of educational practice and networked learning in technologically dense classrooms. The approach of the discussed study is informed by Actor-Network Theory (ANT) (Latour, 2005) and the paper outlines the methodological consequences for adopting principles associated with ANT and post-humanist critiques of representational epistemology. The discussion is organised around overcoming an offline/online binary of educational practice and the use of screen recording software for data collection in ethnographic fieldwork in upper secondary classrooms. In this example, ethical ramifications are brought to the fore in relation to post-humanist traditions (Barad, 2003). The paper argues that the uncertainties exposed by troubling the two categories of human and language, by way of ethno-graphy, can serve as resource for a research practice informed by ANT.

## **Introduction**

This paper is a discussion on methodological considerations for inquiring into digital components of educational practices in upper secondary classrooms which are enacted simultaneously with aspects of online and offline. The overall aim of the PhD research that is discussed is to account for the entangled character of teaching and technology in contemporary educational practice by paying attention to software and web technologies in the everyday schooling situation. In this setting, as with forms of networked learning in general, the physical occurs with the digital, and vice versa, and sociomateriality is an umbrella term suggested for a range of emergent approaches to the entangled practice associated with education (Fenwick, Edwards, & Sawchuk, 2011). Particularly, the sociomaterial approach of Actor-Network Theory (ANT) (Latour, 2005) is informing the study that the paper has emerged from.

A premise of the paper is the observations made by Fenwick and Edwards (2019) in their recent review of ANT-studies in educational research. They notice that methodological dilemmas have yet to be more fully explored in these approaches. With this in mind, the paper is guided by the question: What might the methodological concerns and dilemmas be for an ANT-study of the online/offline of education? Grounded in the decision to use ethnography with ANT, the paper discusses qualitative research methodology for an inquiry of digital engagements in classroom settings to emphasise some of the methodological considerations. Insights are most notably drawn from the post-humanist tenet of (some of) post-structuralism (Barad, 2003; Latour, 2005; MacLure, 2013) and examples are illustrated by ANT-scholars in educational research (Fenwick & Edwards, 2019) and specifically a selection of ANT-studies on digital education (Decuyper, 2019; Decuyper & Simons, 2014; Gourlay & Oliver, 2018; Sørensen, 2009).

The arguments for a rethinking of ethnography with ANT in the context of networked learning are framed by and developed over two troubled categories; (1) “ethno-” unsettled by the decentering of human subjectivity and (2) “-graphy” troubled by non-representational epistemology and the diminished role of language. Furthermore, it will be made clear that both feed into ethical and practical considerations for a research practice and how an

interrogation of "digital dualism" demands of an ANT-methodology to take seriously the notion that the digital is never alone.

## Actor-Network Theory as methodology

Methodology is here understood as how an inquiry approaches theory, method and analysis in order to at the end of the day claim contributions. Methodology is in that way not detached from the purpose of a given study.

Biesta et al. (2019) comment in a recent editorial that a contribution from educational research does not have to be confined to finding useful and applicable solutions to the problems of education, teaching or learning. Instead they call for educational research to identify problems and in a sense create and cause problems about education. In relation to methodology, I take this as a reminder for qualitative researchers to trouble what the research process has to offer and in a deliberate manner resist instant ordering and accommodating solutions.

A methodology is closely linked to what kinds of research questions can and might be articulated or even imagined. A methodology is already at play when questions emerge, rather than following in a linear sequence of first asking the questions and then applying the methods. The research questions of the project tended to in this paper are ANT-informed and made possible because of how agency is understood relationally, instead of confined to human subjectivity. The set of questions is directed at digital engagements and networked learning in classrooms; how does digital technology act in teaching? Which alliances and relations do they form in education and what do they produce? How do these relations stretch and reach in a collapsed separation of local and global? Who/what is teaching? The research topic identified by these kinds of questions connects to current debates such as algorithmic education and accountability (Perrotta & Williamson, 2018) and data-driven change in "backstaging the teacher" (Macgilchrist, 2017). Two areas of interest are reflected by this set of questions. The first is in examining a particular discourse which has claimed transformation to be brought about by digital technology and the second interest is in investigating pedagogic practice and the ways it unfolds in technologically dense schools (Fenwick & Edwards, 2019). There is nothing remarkable in pointing out that different questions can be asked in different methodological traditions. It is merely to demonstrate how an ANT methodology can make possible a turn to materiality of educational practice and describe the intricacy of how and where digital technologies, such as platform and algorithmic logics, become tangled up with the teachers, the students and the pedagogies performed in the classroom practices.

General descriptions of digital education as technically and socially connected, e.g. of involving internet connectivity, social media networks, Learning management systems and abundant online resources, holds connotations to the network metaphor of everyday language. However, what may look like a kinship and potential alignment between concepts such as "networked learning" and "actor-network theory" is, I suggest, a false association. The use of the word "network" may mistakenly appeal to applying the latter as a framework for understanding the former, a misreading not unheard of. The mistake, says Latour (2005, p. 142), lays in confusing "the network that is drawn by the description and the network that is used to make the description". In Latour's (1999) proposition of ANT, a (actor-)network denotes a method and not a stabilized object, such as a technical network (of school computers) or a social network (of students across chat groups). The phenomena under ANT-investigation may display networking qualities and shape, or it may not. Though it is beyond the scope of this paper to give a detailed account of why this is, the aim is to illustrate that asking ANT-questions require dealing with core epistemological and methodological assumptions. Next section discusses this in terms of representation in traditional ethnography before turning to some rethinking offered by critics of representational research.

## Ethno-graphy and representation

A complex history, including a problematic application by Western anthropology, has left ethnography without a standardized meaning (Hammersley & Atkinson, 2007). Nevertheless, it is possible to etymologically derive that it concerns "ethno-", the social lives of a group of people, and "-graphy", a written account of those people. For the purpose of this paper, these two elements translated into the categories of humans and language will serve as frames for methodological considerations starting with representational epistemology.

A representational epistemology is one where knowledge about the world relies on access to its representations. It is in other words a commonsensical and intelligible way of conceiving what qualitative research method, including ethnographic, is about. In this paradigm, research questions into meaning appeal particularly to a representational logic. One such question might be for example, what does it mean (for students or other social groups) to be educated with digital technology? The following, somewhat simplified, handbook example is illustrative of how representational epistemology may align with research method. Emerson et al. (2011) explain

in their handbook on how to write ethnographic field notes that their view of the social world as that it is an interpreted reality. The underlying assumption here is the unmarked position of the human as the interpreting agent in understanding and making sense of the social world. Representation is operating in the notion that language (i.e. representations/knowledge) is how the world (represented/known) is accessed (by humans). Emerson et al (2011) go on to base their advice for writing field notes firmly on a system of representation when they suggest the ethnographer puts personal impressions aside and instead makes sure to note what the informants find meaningful and significant in their social world. This, they suggest, are some of the important details to capture in the ethnographer's field work. The particular kind of field work endorsed by this view is one where face-to-face interaction is privileged and achieving deep (rich) descriptions of the lives under investigation is a main focus. The researcher role is positioned as a separate observer whose task is to avoid contaminating data yet fully capable of accurately ordering the lives of others. Lather (2013) identifies this particular movement in qualitative research as one under the heading of liberal humanism, concerned with authentic voice as a measure for getting as close to the truth as possible. Next some of the counterarguments posited by critics of representational epistemology will be outlined and position ANT with post-humanist critiques of representational thinking.

### **Non-representation as post-humanist critique**

The post-structuralist critique of representation, explains MacLure (2013), holds that it manifests a discursive/material binary which privilege language over matter in a rather contradictory and imperial position outside of the world and the entities it represents. The representational system comes with order, structure, and hierarchy. At the same time critics recognise value in studying what a practice of representation "does" and the critique does not equate with denying that representation regularly occurs (MacLure, 2013). Feminist and post-humanist scholar Karen Barad states that representation between knowledge and the known inevitably leads to questions about the accuracy of representations and more importantly what account for its operations, "If words are untethered from the material world, how do representations gain a foothold?" (Barad, 2003, p. 811). A humanist move to insert a third part, a knower, into this bipartite system of knowledge and known does not resolve the issue since the post-humanist strategy seeks to decentre human subjectivity rather than elevate it as it is elevated in representational epistemology. The metaphysics that critics of representational epistemology have responded with makes possible the tethering of social and material in proliferating hybrids in what Barad (2003) calls "agential realism" and in Latour's (2005) terminology is "actor-network" and, more rarely, sociology of associations. The Deleuzian concept of "assemblage" is also a materialist response to representational epistemology (MacLure, 2013).

Asking ANT-questions of about materiality of digital education and networked learning requires therefore a decentring of the human subjectivity that is associated with representational epistemology. This move interrupts the category of human from being the taken for granted locus of knowledge, agency or ethicality. A question like "What is teaching?" can suddenly take on different meanings. And new questions can begin to trouble the methodology. What about the participants, the "ethno-" /people, in ethnography? And what about another central subjectivity - the researcher's? Furthermore, a non-representational approach to research brings into question the prominent role of language, the "-graphy". Where does that leave the written account of the ethnographic field work? The practical implications of questions like these are very real when it comes to entering the field.

### **Entering the fields of online/offline education**

Turning to more practical issues of methodology, the matter of how to access the relevant field has been one of the corner stones in ethnographic research and certainly not one easily settled in the context of networked learning. The methodological question to consider for the ethnographer, ANT or otherwise, has to be where "to go" in order to account for digital engagements and networked learning in classrooms. A classic locality of educational ethnography is the classroom where human actors and face-to-face interactions can be privileged. Landri (2013) problematizes ethnographic investigations of education and technology and notes that this locality is rendered problematic from the point of view of sociomateriality given that digital technology is not necessarily confined to the walls of the classroom. This second part of the paper will review a small selection of ANT-studies in digital education and attend specifically at how multiple ethnographic sites have been used and also how the offline/online binary may be overcome by reconsidering the category of digital.

### **Actor-Network Theory with ethnography**

Sørensen (2009) uses a multi-sited ethnography with an ANT informed methodology to study materiality in educational practice. Her work shows some of the shifts that traditional ethnography needs to undergo when

ANT is used as the sensitizing device regarding post-humanist assumptions of e.g. non-representation. What this shift holds is for example that binary categories and the hierarchies they uphold need to be reconsidered, such as the split between human/non-human but also subject/object, social/material etc. The category of "digital" can also be added to this lists and deserve some extra attention given the topic of the paper. In general, ANT-studies move away from a privilege of human interactions to a generalized symmetry, which means acknowledging the potential for humans and non-humans to have equal importance for the empirical inquiry aligned with non-representational ontology. The ANT principle of symmetry suggests that an actor can be human, non-human or more-than-human. For Latour (2005, p. 46) an actor is not the source of action but made to act by other actors, and it is an entirely empirical question of who or what is an actor in any given inquiry, not a decision based on identity. Under these assumptions, objects too can have agency. It follows then that in interest of finding out what actors do and how they assemble in actor-networks requires tracing them in the field, once they have been identified (Decuyper, 2019; Latour, 2005).

A related way of thinking about how to do ethnography with ANT is that following actors in the field is to gather "flat descriptions" rather than in-depth explanation (Latour, 2005). A set of inquiry strategies is proposed by Latour (2005) in order for the researcher to keep the field flat and gather descriptions of the actors and group of actors and the relations they achieve and dissolve. Here, Latour emphasizes the importance of observation in conducting an ANT-inspired inquiry and methodologically minded scholars have added to what these observations may entail in practice, e.g. observation protocols, to avoid the risk of otherwise unmediated observations (Decuyper, 2019). One of the ethnographic sites in Sørensen (2009) is how her research team assemble the 3D computer program that they then use as study object in two primary schools. This move shows that when flat descriptions are unfolded and objects followed, the ethnographic site becomes multiple and some of them are located with the inquiry itself. The research project, such as Sørensen's (2009) research design, is not detached from, our outside of, what is being studied.

### **Collecting data of online/offline education**

The issue of an online/offline binary with implications for educational research is raised by Gourlay and Oliver (2018) with regards to student engagement in higher education. Their study is guided by ANT principles such as those outlined in the previous section, e.g. general symmetry and flat descriptions. They take issue with a dominant view of "digital dualism":

[...] 'digital dualism' - the tendency to posit the analogue and the digital as a clearly observable binary. A feature which characterises this dualism is the tendency to present the digital alone as technology, implicitly excluding the non-digital from the category. As a result, the technological status of print-based practices and artefacts is rendered invisible, arguably leading to a view that these come to be seen as 'given' elements of education, which is portrayed as an entity standing somehow outside of technology. (Gourlay & Oliver, 2018, p. 23)

The issue raised here translates to some interesting and important methodological challenges of how to overcome the digital as a separate domain harnessing more impact and potential for educational practice, than that which is non-digital. How can continuities of print-based and digital practices be captured empirically? Gourlay and Oliver (2018) opt for an interview method where informants take photos and produce graphics of how, where and with what they study and these students' accounts of digital engagement are core part of the data collection (Gourlay & Oliver, 2018).

Another related example is a study reported by Decuyper and Simons (2014) who examine academic practice and the role of digitization for the daily lives at universities. They engage with questions about the sociomaterial composition of academic activities such as using software programs, e-mail correspondence etc. They adopt an interview technique where participants in great detail recount the activities from the previous day in a manner where "[...] feelings or meaning-giving of the respondent were of no primary concern" (Decuyper & Simons, 2014). Decuyper (2019) comments that the interview technique was born out of an awareness of the intrusion and ethical ramifications that observing the personal screens of these academics would entail. There was considerable doubts that respondents would be at all willing to take part in having their personal and professional screen activities recorded, a reason for designing the interviews the way Decuyper and Simons (2014) did.

The studies by Gourlay and Edwards (2018) and Decuyper and Simons (2014) are particularly relevant as they use an open design and ask what students' and academics' practices are composed of with a sensitivity to include, i.e. follow, digital components on the screens of personal devices in educational and physical setting.

They do not enter the examination with a fixed interest on a specific app, program or platform. A concept like digital dualism can be helpful to take seriously the argument that the digital is never alone. The digital/analogue binary needs to be collapsed if practices are to be traced across these domains as ANT suggests. This small body of literature has emphasised the ethical considerations, e.g. privacy, that are involved with researching how the digital come to act in different educational practices.

### **Ethical considerations with screen recordings**

The PhD thesis that this paper is organised around is facing similar issues to that of Gourlay and Edwards (2018) and Decuyper and Simons (2014) of how to ethnographically study education and teaching practices in what is simultaneously in online and offline modes of upper secondary education. Inspired by their arguments, one of the ethnographic sites of the project will be student and teacher screen activities. To this end, screen recording software will be installed on student and teacher devices in a smaller selection of the informants who have been and continue to be involved in the ethnographic study. The recordings are accompanied by classroom observations and other ethnographic field work, so that the digital is not alone in making up the ethnographic site in this subcomponent of the research project. The standpoint is not that recordings are used to come closer to a true representation of screen activity. There are several technical but mainly ethical issues with this design that deserve some considerations in this paper.

Technically, the software chosen must not require emails of participants to be registered upon installation and not share recorded data with any other parties. The screen recording technique relies on not only informed consent from students and teachers but a willing cooperation on their part to engage at several occasions such as during installation, launching, controlling the program and recording classroom sessions. The recorded files need to be manually shared with the researcher to avoid cloud storage for data security reasons. These technical and practical matters should not however be allowed to eclipse the much more important ethical issues. The ethical considerations of regulatory nature are about weighing risk of personal harm against scientific contribution. However beyond such regulatory frameworks, an ANT informed methodology invokes ethics with regards to data analysis and even beginning in ontological assumptions, both outlined next.

#### *Ethics and data analysis*

The post-humanist strategy of decentring human subjectivity, discussed in the first part of this paper, need to be taken into account for ethical considerations. This strategy shifts and destabilises participation as the main and sole qualifier for conventional research ethics regulations and brings data into the ethical conversation. Research data from human activities, for example screen recordings from classrooms, come with sets of ethical entanglements of their own, rather than just being residues to be harvested for research purposes. Markham (2018) argues data use is one of several specific impact arenas for researchers to consider. Data is generalized, categorized and put to use for a variety of purposes to impose and shape society, such as predicting group and individual behaviour, particularly with large datasets. Small and qualitative data also have an impact arena and the ethics concern how data is coded and how exclusions are made. From the point of view of ANT-research and the topic of this paper, boundaries between subject and object are broken down with implications for how the researcher and the research data can be understood. MacLure turns to this issue of data in non-representational qualitative research. Notions of “interpretation” connote meaning and meaning-making which “is in the compass of representation” (MacLure, 2013, p. 664). Her observation highlights that data and data analysis is not so straightforward but rather caught up in the ethics that follow from non-representational methodology, such as ANT.

#### *Ethics and ontology*

This elaboration on the ethics and data of recording screen activities thereby brings us back to methodological implications of non-representational and post-human critiques. When Barad (2003) introduces “agential realism” as a critique of representational epistemology discussed above, she identifies that ethics is tied to ontology, the becoming together. Ethics then is perceived as preceding epistemology, since ethical responsibility is established before language and before anything is known about the other. There are no relations where ethical responsibility for the other can be avoided or opted out of, and there is no coming together without relations. It is quite different from the alternative view of taking ethics to be about linear consequence of human action, knowledge or intention. Neither agency nor ethics can under the assumptions posited by Barad (2003) be confined or located to any one individual. They are instead the effect of the human and non-human relations on which they are (per)formed. This tradition of thinking about ethical responsibility, inspired by ethics philosopher Lévinas, sheds light on the post-humanist move as an ontological turn taken in the name of ethics.

The ethical responsibility of the PhD project for participants, the ethnographic data and prospect of modest contribution began when the project first started. The field is in this regard already entered.

## A summary of methodological concerns

The topic of this paper is to explore what some of the potential methodological concerns are in studying sociomateriality of education and technology, here pinned down by classroom practices which can be considered to be in both online and offline modes. The purpose has not been to solve problems but rather to flesh them out and examine how uncertainties feed into research practice with ANT and ethnography. This concluding summary will revisit the frame of "ethno-" and "-graphy".

### Ethno-

First a consideration of the humans involved in ethnography, the researcher and the participants, the "ethno" if you like. That the gap between the researcher and those researched is not an innocent one without contamination is widely recognised in ethnographic research, even though Emerson et al. (2011), who were cited in this paper, made it out to be a straightforward and unmessy researcher position. Reflexivity is a significant feature for dealing with the consequences of the researcher belonging to the social domain that is interrogated (Hammersley & Atkinson, 2007). The meaning that Davies (1999, p. 4) gives to reflexivity is that it entails a "turning back on oneself". Reflexivity is complex and based on a post-humanist critique it is possible to make it even more problematic as it appeals to the essence and knowledge associated with researcher subjectivity, "oneself". If reflexivity can be understood as a humanist strategy of locating a solution in the individual agent – what option is there for a post-humanist ethnography? A dilemma appears to be how to decentre researcher subjectivity in ethnographic work, while not becoming detaching from it as detachment is not possible. It would suggest that the researcher is not operating freely under rationality or intention, the common-sense of qualitative research is troubled.

An important realization that this paper has surfaced in response to a decentred human subjectivity is that it is not sufficient to limit an ANT informed ethnography to the classroom and the material devices of the classrooms, even if they include screen activities. The ethnographic sites cannot be separated from the inquiry itself. Sørensen's (2009) response is to include the very construction of the research design as one of the sites in her multi-sited ethnography. I take her response to be a "second experiment" that Latour (2005, p. 135) says must be undertaken to account for the performative action of the inquiry itself. With the assistance of feminist scholar Donna Haraway (1988), I understand the second account to be one of ethics and taking responsibility, in terms of being answerable to the situated knowledge of the inquiry.

### -graphy

A critique of language as representation has been another theme, framed here by "-graphy". Language is by all accounts involved in qualitative research, this one is no exception. The empirical data from an ethnographic classroom study is largely made up of written descriptions taking into account the actors and how they connect and disconnect etc. Additionally, screen recorded data as instances of material enactments must be translated into written descriptions. Latour (2005) argues as that a well written description does not need explanation, as long as descriptions remain flat, as one of the ANT principles. Language is part in achieving that description. Given this, what status can be given to the ethnography if it is deployed without representation? For ethnographic research not adhering to representation, the claim of the written account is not about accurate representation. Latour says that there is a fine line between on the one hand to look for acceptance for a description by those involved and to impose meaning onto them on the other. He demonstrates this by carefully separating "the two tasks of taking into account and putting into order" (Latour, 2005, p. 257). It seems to be a nuanced detail to take note of for non-representational research practice.

Then there are the categories that language makes available. The notion of digital dualism was brought into this paper to illustrate that language seems to uphold a dividing line (e.g. online/offline, digital/not-digital) rendering the very intersection masked and slippery. The digital as a defined domain and category carries a strong appeal, certainly in the context of networked learning. What can unseat it from this privileged position, is a delicate question bound to remain. It is a recognised and ongoing struggle for ANT-informed research to resist translating sociomaterial practice into symbolic representation, e.g. by relying on pre-given categories such as "digital" in the context of digital education (Fenwick & Edwards, 2019; Fenwick & Landri, 2012). The second experiment mentioned above, I suggest, may serve to enquire into such assumptions and what they achieve in terms of binaries and hierarchies etc. Likewise, the question "what is teaching" can help to interrogate another often taken for granted category in educational practice.

## Conclusion

It has been a principal argument of this paper that in order to allow for the questions on materiality of education that ANT makes possible, the full artillery of non-representation and post-humanist thinking need to be deployed as methodology. This however does not translate to a readymade manual of how to deal with the various practicalities and issues they involve as outlined in this paper.

In conclusion, it is one thing to read literature on non-representational methodology and agree with the arguments – it is quite another to escape the common-sense of representational thinking. Uncertainties about what to do and how to do it remain largely unresolved. Latour (2005) insists that uncertainties, ambiguities and controversy should not be shunned or reduced but taken as resources for social inquiry and for methodology. The reported set of concerns and uncertainties that this paper has illustrated may serve as such a resource going forward.

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