Emerging Networks - A study on learning networks during the Covid-19 lockdown

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Abstract

This paper discusses findings from an investigation of students' experiences from and participation in different learning networks during the Covid19-lockdown. The investigation is based on empirical data in the form of 32 interviews with students from a variety of University College Programmes (business-, administration-, construction-, technology-, health-, pedagogy- and teacher education). The interviews were collected as part of a larger study, where data also consisted of responses to surveys from, potentially, 84000 students. In the interviews, the students shared their experiences regarding learning and teaching online, respectively. Three cases were singled out aiming to maintain a high degree of complexity and maximum variation. Through the contemporary theories within the field of Networked Learning, we aim to show examples of how the students were networked during the Covid-19 shutdown and the implications that emerging networks had on their participation in online educational activities. Furthermore, we wish to make a suggestion for the use of the applied categorisation of networks for analyzing how students are networked. These categories, presented in this paper, are proposed by researchers within the field. The main findings suggest that online teaching during the lockdown required students to establish new patterns of participation, thus, establishing new structures and ways to collaborate. This led to emerging networks supporting different aspects of their life setting as students and creating opportunities for engaging in new social configurations and learning.

Keywords

Networked Learning; Patterns of Participation; Higher Education; Empirical Research; Analytical Framework

A Covid-19 Lockdown Study

On the 11th of March 2020, all higher learning institutions in Denmark were closed by the Danish government due to the Covid-19 pandemic. On a very short note, all educational activities had to be transformed into online activities. This, in short, meant that future participation and collaborations had to take place in online virtual environments, whether students had previous experiences or not. The rapid change offered researchers a chance to study the changes that occurred, and the implications on students' learning practices.

In June 2020, a mixed methods research study on online teaching across universities and university colleges was conducted (Georgsen & Qvortrup, 2021). 84000 students shared their experiences regarding learning and teaching respectively in a survey and further 32 students subsequently participated in interviews. The interviews focussed on how students managed to establish a learning site in their homes and on their individual personal experiences e.g., challenges and potentials regarding online participation in courses. Overall findings from the survey and interviews suggest that the quality and level of activity decreased during the period. The report further outlines that a plausible reason for this is the change of demands and requirements, that participation in online learning environments imposes on the learners, and that ways to engage and participate as a community need to be renegotiated and reconfigured (Georgsen & Qvortrup, 2021).

Research question

Much research has been done on online teaching and learning both before and after the Covid-19 lockdown. As highlighted by MacKenzie et al. (2021) responding to The Manifesto for Teaching Online (Bayne et al., 2020) the predicaments of online teaching as well as it's potentials have continuously changed in connections to new technological opportunities and new ways to think about online education (Cleveland-Innes & Ostashewski, 2019; Hrastinski, 2022). The contribution of this paper is an investigation into how students experienced the move from everyday learning to participate in fully online learning networks. The research question that guided was: *How do digital networks emerge, and support learning processes and which types of networks do the students participate in as part of their learning trajectory during the Covid19-lockdown?*

Learning in a networked world

The understanding of networked learning being advocated for in this paper and guiding the data analysis alludes to the often-used definition within the Networked Learning community as "learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners; between learners and tutors; between a learning community and its learning resources" (Goodyear et al., 2004). As de Laat and Ryberg (2018) stress, this definition highlights the importance of both human and digitally mediated participation. Networked learning is characterized by the notion of learning through and by "connections" and "connectedness" underlining that mere interactions with technologies and resources in isolation are not sufficient to fit within the definition. Networked learning calls for connectivity that may change the actors in the network and not only exchange information, which is what the term 'translation' describes in Actor-Network Theory (Latour, 2005).
The analysis provided in this paper is not focusing on the topology of the network, but rather, on the exchanges, hierarchies, and interactions in the network. We further deploy Jones' definition of networked learning (Jones, 2015, p. 241) emphasising the shared experience of solving problems and learning in a community that is facilitated by digital networks. In this sense, the "network" in networked learning consists of actors, both human and non-human, who contribute to the manifestation of the network and to the exchanges within the network.

Method

This study builds data from 32 interviews that was conducted as the qualitative part of a mixed-methods research study on online teaching during the Covid-19 lockdown with the participation of nine higher education institutions in Denmark (Georgsen & Qvortrup, 2021). The interviews were conducted after the lock-down in the period mid-September to the end of October 2020. The 32 students were interviewed individually each of approx. one hour duration. Participants for the interviews were selected strategically on the basis of their answers in a survey, with the aim of achieving a spread on two parameters: academic subject area and attitude towards online teaching (Georgsen & Qvortrup, 2021). Though the survey is not directly included in this paper, it functions as a subordinate backdrop. The interviews were semi-structured (Kvale & Brinkmann, 2018) with questions focusing on the students' experiences with online teaching, perceived learning outcomes and how they managed to establish a learning site in their home. The interviews were recorded and verbatim transcribed in Danish. To utilise significant passages from the interviews in this paper quotes were selected, condensed, and translated into English.

Our analytical approach involves what Bryman (2016), and Schwartz-Shea and Dvora (2012) describe as an abductive strategy, where identified 'disturbances' in the ways the students' experience being part of networks are used to suggest further exploration. Initially, the interviews were analyzed by deploying an exploratory coding strategy focusing on the students individually developed strategies and competencies, on group structures, their collaboration with fellow students, on how the students meet the conditions, requirements, and opportunities that the situation placed on them. A case study approach (Yin, 2018; Flyvbjerg, 2010), was conducted in order to process and relate the interview data systematically to the complex phenomena of learning networks while maintaining an exploratory approach. During this work (Bryman, 2016), the distinction between network as *people*, *situations or context*, *infrastructure* and as an *actant* itself, as proposed by Dohn et al (2018), was chosen as a relevant analytical approach. By looking across the four types of networks, it became possible to contribute with knowledge about the position each type of network occupies for specific participants. The authors further developed and operationalized the categories as units of analysis in the following way:

Category 1 (C1): **Students' participation in a network of people**: Is used to map the people included in the students' network learning strategies. It is introduced as a reference to network the students participate in, during their learning process along with other people. These networks can be formal as well as informal and include both peers, classmates, study-group members, educators, university college and 'strangers'.
Category 2 (C2): Students' participation in a network of situations or contexts: Sheds light on how students resituate knowledge and patterns of participation in new situations and contexts. Information or communication technologies or learning management systems as well as other means can support this process, but they are not the focus of this investigation. It is introduced as a reference to the learning that arises from connections between situations and contexts such as class, courses, study groups or other situations facilitated by the university.
Category 3 (C3): Students' participation in a network of ICT infrastructure: Focuses on perspectives on the ICT mediation of learning, computer-supported collaborative learning (CSCL), enabling connections across space and time.
Category 4 (C4): Students' participation in a network where the network is an actant itself: Emphasizes students' socio-material entanglement with objects and other people. Informal: Greater networks of 'strangers' in non-institution platforms – e.g. organised by hashtags or handles. Inspired by notions of the 'rhizome', 'line of flight' and 'plateaus of intensity' (Deleuze & Guattari, 1987, p. 22).

Table 1: Own development, inspired by Dohn et al. (2018).

A second reading was now conducted, distinguishing between the four network types, and three cases showing in different ways how students were networked during the Covid-19 lockdown were singled out, prioritizing diversity regarding the learning trajectories the students followed during the Covid19-lockdown, the kind of networks represented by the students, and how the networks appear to have supported their learning. The three cases represent great variation aiming to maintain a high degree of complexity and maximum variation in the analyzes (Flyvbjerg, 2006). Furthermore, this perspective was not investigated as the report by Georgsen and Qvortrup (2021) didn't focus on students' strategies for participating in learning networks.

Case 1: Disturbed and expanded learning networks

In the first case, we are introduced to "Anna" who follows a Bachelor of Public Administration programme, that is offered both as an on-campus and as an online program. Anna is following the online program, and as the Covid-19 lockdown applied, she was already used to attending online classes and the most radical change was that the fellow students who used to attend classes on-campus were now attending the online classes as well. Due to the lockdown, however, a new practice and context for group work - breakout rooms - was introduced expanding the network of online participants. Anna was first skeptical to this change as she preferred to stick to an already established, and for her important network - her study-group:

> In my study group, we know each other really well and we know what happens in each other's private life and such, and maybe we actually know each other better I think than if we had met each other on campus.

Another point of attention expressed by Anna was that the requirements for studying online are different from participating in courses on campus:

> It requires more self-discipline and yes it just generally requires a little more (...) You really must be present when you are online, because if you're mentally *checked out* then you miss pretty much.

When asked about participation and group work in online classes, right after the lockdown Anna explains that there was a clear split between, what she refers to as 'the online'ers' and the 'the others'. As the lockdown proceeds, the situation, however, seems to change for Anna:

> In the second module, we were put more out in mixed groups and got to know some of the others actually. So, there was also small talk, i.e. when we had to do assignments. So, you got to chat a bit about something else as well, and that is what we also did in the study group, right?

The case shows a student, who sees herself as primarily networked within an important network of people (C1) - her study group. During the lockdown, this well-known network was both expanded and experienced to be invaded by 'the others' leading to uncertainties. Further, the boundaries between the students following the program online and students that participate in the program on campus, was initially reproduced in the now joint online setting, and breakout rooms are emphasized as a context (C2), that supported her in getting acquainted with the students she didn't already know from the online setting. The breakout rooms are comprehended as actants in themselves (C4), as the process of establishing these new online groups are proposed to offer a particularly suitable structure for novel collaborations.

Anna emphasizes structure, routines, and people as equally important when it comes to being connected to her study group. In her opinion, her study group benefited from already being an online network, while the introduction of breakout rooms is experienced as a new way of framing collaboration. Even though Anna perceives the breakout room sessions as an opportunity to be connected with students she was not previously connected to, she also finds it to be a connectedness that requires a surplus of mental energy from her. One explanation offered by Anna is that it requires extra effort and self-discipline to establish and participate in an online study group e.g., endurance, focus and high attention to one's learning strategy. Anna points out that the challenge was even greater for 'the others', who were not used to online teaching and who had not yet - unlike Anna - developed personal online learning strategies.

Case 2: Learning network supporting the development of professional skills

In the second case, we meet "Jane" who is enrolled in a 2-year Academy Profession programme in Computer science and is a skilled and experienced participant in several types of learning networks. Jane's overall perception of her study life during the lockdown is very positive and she doesn't find online teaching as more demanding than her usual everyday study life.

Jane has a very specific view on the role of the learning networks and her part in them:

> Many [of my fellow students] think that we are missing a bit when it comes to the social part of studying, but I must admit, that I am not here for the social…I think this [lockdown] has empowered me in terms of not being afraid of having to take jobs online.

Throughout the interview it becomes clear that for Jane the network and the people in it serve as a structure for engaging in the content of the course and the development of professional skills (C1) such as e.g., being trained in moving in and out of various online settings, participating in different ways, introduced to new mediating teaching tools, or forced to find solutions to problems in relation to database connections. Furthermore, Jane seems to have a special focus on establishing clear structures for cooperation within her study-group (C1):

> It worked super well because we structured the day well. …When a task was given, we jumped into our [Discord]channel. Then we can share if there is something we struggle with. I think we're pretty good at it. We work super well together. We are a very good match" ... If I pose a question in our chat channel during the afternoon or evening, then there is an answer as soon as one of them [participants] are online.

Jane is not using Discord to be social but perceives Discord as an effective platform for learning (C3). On the same note, Jane explains how it was obvious for her learning network (the study group) to connect over Discord, as they already used it as a communication platform in the class. It is not only the study group that appears as a central actor, so does the joint Discord channel as an agent that is characterized as a part of a super good match. Here, Discord serves as an essential infrastructure that enables connections across space and time.I It is

perceived as a flexible and relevant context that facilitates her learning process during the lockdown, in a way that is different from her experience with learning on campus.

Jane also mentions Zoom as an important ICT infrastructure, by which the educator could support the students through synchronous screen sharing, drawing tools and organizations in sub-groups. Again, the study group emerges as an important network that adds support to Jane's learning process. While PowerPoint is a well-known presentation software that Jane recognizes and is familiar with from classes on campus, the video conference system features were new to her. And her favourite system was Zoom (C3), as the affordances, it has to offer to support her learning approach. The Zoom infrastructure becomes a central focal point that enables Jane to commit to the academic content and establishes a situation where she is networked to both educators, fellow students, and the academic program at the same time. Jane appreciates being able to act intuitively during class, to be able to ask questions or ask the educator to elaborate on issues if she is in doubt or does not immediately understand the professional aspects taught. This strategy seems to be essential for her way of participating, as she appears to be very energetic. Precisely the connection to the profession and the professional elements appears to be particularly important to Jane and as she experiences that development of online learning strategies to a great extent, equips her for her future profession, she gets even more motivated. Though her motivation for participating does not seem to be driven by the desire or ambition to connect socially with her fellow peers.

Case 3: Instagram as a learning network agent

In this case, we are introduced to 'Kate', who studies nursing. During the interview, Kate explicates that one of the challenges she faced during the lockdown, was related to the social aspects of her life as a student. During the lockdown, Kate, therefore, starts to post content related to a hashtag on Instagram:

> [...] to form a relationship with the followers we now have [in Instagram], I started the theme 'A day in my life under the corona'.

Kate starts to share her everyday stories, challenges, and experiences on life as an online nursing student during the lock-down under the hashtag: 'Follow [student name] for a day' on Instagram intending to nest and nurture social interaction:

> It [the posts] was a lot of this, well, I must have group work now, and I must have a lecture now, and then all these things, and how I read homework and stuff like that, so you could kind of motivate each other, uh, so you just could get that little kick you might need.

Later in the interview Kate continuous:

> When you are in such a situation [lockdown], I just think that relating to someone on the same level [peers], uh, commenting on what kind of coping they kind of do. That's why I took the initiative.

Kate explains that the university provided a space in Teams named 'homework support', and that this space was intended for homework support and socializing (C3). However, only an average of 5 students participated. Kate explains that she hesitated to participate, as she found it a slight hassle. While Teams is a learning platform designed to support communicative needs in learning processes in a hierarchical network, social media platforms are designed to support spontaneous needs for communication in ahierachical, nondemocratic ways. This also goes for Instagram, which as a network is characterized by the symmetry between human and non-human actors, where the ease and frequency of participation, thus, defines the power of it.

> But [in Instagram] we have actually got a lot of followers [...] right now we have 300 followers. It's far, far more than there are on teams and it's far more than the five [students] that were to… for the homework cafe [in teams]. [...] Well, it's just because we have institutional IT [...], and then we have this parallel track, right.

Kate explains that the intention with this common hashtag was to establish an online facility, where she and her fellow nursing students could share everyday 'lockdown moments' and promote academic dialogue organised through hashtags.

During the lockdown this social network became more systematic and formalized through a weekly, designated student 'take-over':

We called it "follow this class for a day" or "follow this student for a day" or "Follow Kate, fourth-semester student for a day". [...] Then I posted something, personal or academic, and received a lot of comments and feedback. And it was really good, it engaged people.

The network reached 300 contributors and since the network was organised through hashtags and a shared handle many of the contributions were from 'strangers', such as nursing students from other University Colleges. A condition for the emergence of the network was that the contributors were equally important and that the network relied solely on their participation. Kate explains that she thinks the success of the activities relied on the convenience and ease of contributing. This leads her to suggest, that the university could apply similar strategies:

I think they should use us, the students, as a means to reach more co-students than they can. Uh, because there have been a lot of monologues in relation to what they're conveying to us. I also think we could contribute a lot and then make a really good collaboration out of it instead. Uh, so I think that would be using us as a resource instead.

Here, Instagram is positioned as a non-human actor in the network, not only did it provide the necessary infrastructure (hashtags and handles) for the learning network (C4) it also played a significant role as a facilitator of the network's outreach and accessibility. The hashtag and the handle became a plateau for various, organically emerging interests for networking such as social sharing, expanding connections and academic support. This Instagram network did not only become an academic community in which students could engage in comment/ reply to threads, but it also facilitated connectedness established through the sharing of feelings of seclusion and loneliness.

Discussions and conclusions

From a general perspective, the cases above represent a variety of ways the students were networked during the covid-lockdown and how different patterns of participation were applied to the new situation of their life as students. Few examples from the larger dataset have been highlighted to show how the distinction between network as *people (C1)*, *situations or context (C2)*, *infrastructure (C3)* and as an *actant itself* (C4) can be used as units of analysis to identify the kinds of networks the students participated in during the lockdown.
The analysis of the cases shows how expansions of networks set forth new requirements for participation and social configurations.
In the first case, the expansion was forced onto already existing and well-functioning communities, and it was initially comprehended as a disturbance of the existing practices within the communities, respectively. The fusion between the two communities challenged the students in the way that they had to establish new joint practices and development of new patterns of participation (Hachmann & Dohn, 2018). Self-discipline and engagement were promoted as key components for participating in the new networks and further that the social reconfigurations required negotiations of roles and expectations towards the network as a new setting for learning. The cases indicate that the students perceive the networks as a way to enhance their professional development. For some students, the social aspects were primary offsets for engagement, while for others the digital infrastructure provided means for engaging in educational content more efficiently. It is remarkable, especially in cases 2 and 3, how the choice of network infrastructure (Discord and Instagram) is chosen due to different reasons. Discord represents a way to create more fluent and efficient workflows while Instagram represents a means to create a network that provides care and support.

An important finding is that the students were not particularly fond of the tools and infrastructures provided by the university. Instead, they established these by other means (Discord, Instagram, Messenger etc.). The cases indicate that online participation led to expansions of the students' repertoire regarding engagement in different kinds of network settings. Empowering them to deploy new ways of being networked that are initiated by themselves supplementing already established institutionalized infrastructures.
These choices were based on personal preferences instead of the University's it-strategy. The cases presented in this paper suggest that empowerment to make student-initiated choices regarding the selection of resources, platforms, and other tools and to create own networks lead to strong ties amongst the students. Furthermore, the students express that this highly motivated them to engage professionally in discussions and group work. As seen in the third case this leads the student to suggest that the university could utilize a more ad hoc and asymmetric approach to establishing networks. In other words, suggesting that the university could learn from the student approach to networked learning described in the cases. However, this notion may contest the nature

of an ahierarichal network since they emerge when a need for exchange presents itself and that a C4 network rarely can be anticipated or formalized.

Future perspectives

We would like to end this paper by asking two questions on different levels. One regarding the empirical data and one of a more conceptual nature within the field of Networked Learning.

- Is the way of establishing and maintaining networks close to the professional identities of the participants?

- Can the four categories of networks used in this paper contribute to a consistent analysis of learning networks?

Acknowledgement

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