Student activity in blended learning environments - a sociomaterial perspective

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Abstract
This paper investigates uses of blended learning in teacher education where students participate through respectively webinars, seminars and self-directed group work to study literacy. Based on a recently implemented study activity model that aims to strengthen teacher students’ academic activity, the paper asks how different patterns of relationships and spatial arrangements produce student activity in specific ways. How are forms of participation, learning and presence performed through webinars, seminars and group activities and in connections between these activities? How do technologies participate in and contribute to creating student activity, engagement and learning? The paper builds on research in a Danish teacher education college where a study activity model has been implemented as part of a joint model for activity in professional higher education. In this model learning is understood through forms of activity that are either student or teacher initiated. However, in practice not only students and lecturers participate in and produce these activities, technologies such as smartboards, pc’s, online platforms and cloud based environments are also significantly involved in creating activities, engagements and learning opportunities. The research project investigates these relationships by studying the arrangements and practices of activities through observations of different activities and interviews with students. Preliminary results from these interviews suggest that arrangements of activities not only vary significantly, but also affect students’ preferences and experienced potential for learning in different ways. Methodologically, the research is inspired by sociomaterial approaches to education that understand learning activities as entanglements created through dynamic relationships between human and material participants.

Keywords: teacher education, participation and student activity, webinars, sociomaterial perspective

1. Introduction
Students at a teacher college in Denmark are studying literacy in a net-based course for mother tongue education (Danish). During the autumn and spring of 2016-17 students at UCL (University College Lillebaelt) have participated in the course through classroom-based seminars, webinars in Adobe Connect and self-organised group- and project work, where they have for instance used Skype and Google Docs to collaborate on assignments. These are blended forms of learning that are organised within a framework for activity used across University Colleges in Denmark called the student activity model. In this model learning is understood through forms of activity that are either student or teacher initiated. However, what activity is and can become in teacher education, is not solely contingent on teacher and student initiation, but also on the complex relationships made in practice between the times, spaces, modalities and materialities of learning face-to-face and online (Hannon 2013, Orlikowski 2010, Boldéen 2015). The paper studies the emergence of forms of activity through these relationships, and asks how different patterns of relationships and spatial arrangements produce student activity in specific ways. Our research is inspired by sociomaterial approaches to education that understand learning activities as entanglements created through dynamic relationships between human and material participants. Through these approaches analyses of the situated and shifting participation of technologies and other materials in education can contribute to nuanced understandings of how activities are generated in practice.

2. Student activity in blended learning environments
In the past decades research in blended learning has thematized the relationships between online and face-to-face (F2F) learning and has attempted to understand its significance for learning (Alammary et al 2014). Historically, the development of blended learning practices has sought to overcome and qualify the challenges experienced with both F2F and online learning, aiming to “combine the best of two worlds” (Bonk & Graham 2006). Though blended learning is in many contexts an ambiguous term (Sharma 2010, Graham et al 2013), it is often used to account for and to some
extent compare the pedagogies, spaces and interactions created by respectively F2F and online learning. Thus, reasons for implementing blended learning mentioned in research are for instance improved pedagogy and access to learning believed to be implicated in flexible learning models associated with online learning (Lopez-Perez et al 2011).

Though blended learning as a practice aims to investigate, expand and develop relationships between F2F and online learning to construct what Garrison & Vaughan (2008) call “the organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies” (p.148), research in blended learning often works to underline and even reinforce the dichotomies of human to human vs digitalised forms of learning (Oliver & Trigwell 2005). The dichotomies involved are for instance assumptions about instructional versus learner-centered practices in respectively F2F and online environments and the flexibility and novelty of online versus F2F learning. These dichotomies to some extent come to reproduce technological determinism in learning and reiterate what Offerman & Tassava (2004) call the relics of old paradigms of learning. In addition to this, the ubiquitous and embedded role of technology in contemporary learning calls for new ways of conceptualising relationships between on- and offline interactions, activities and presences, as argued by for instance Richardson & Wilken (2011). Thus, physical and digital spaces are often not perceived as separate by users of for instance mobile devices, who are continually connected to the internet and therefore naturally shift between a range of spatial interactions, including modalities of presence (2011).

In this paper we wish to investigate forms of activity and presence in blended learning by focusing on the specific ways in which student agency is formed by what Johri calls “emergent socially and materially intertwined learning practices” (2011, 208). This approach aims at transcending the dichotomies of human versus digitally mediated learning found in for instance blended learning theories by studying how specific relationships are made in practice that are constitutive of learning. As practices, FTF learning and online learning are not clearly bounded entities, we propose, but situated phenomena that emerge from patterns of relationships in which both humans and technologies participate. Inspired by for instance Sørensen (2009) and Fenwick et al (2011), who draw on research within STS and ANT, we identify these relationships as sociomaterial arrangements, i.e. provisional networks through which phenomena such as ‘activity’ are created. Investigating forms of presence in a variety of settings (including the virtual world Femtedit) Sørensen (2009) argues that forms of presence are performed in sociomaterial relationships that may change from moment to moment and that each practice performs a specific form of presence. We are inspired by these methodologies and propose that in webinars and seminars forms of activity are not only blended, but entangled, and that studying the “minute negotiations that go on at the points of connection” (Fenwick et al 2011) will enable us to understand the complexities of human-technology relationships in education.

3. Data and methodology

In the research project our methodology is informed by our focus on emergent sociomaterial practices in blended learning, which means that student activity has been studied through the specific relationships made in blended learning practices. The main purpose of the investigation was therefore how different patterns of relationships and spatial arrangements produce student activity in specific ways. How are forms of participation, learning and presence performed through webinars, seminars and group activities and in connections between these activities? How do technologies participate in and contribute to creating student activity, engagement and learning? Thus, data have been produced through observations of webinars, seminars and group sessions, as well as interviews with students and the teacher, which means that we have not looked at for instance how often or how long students participate in sessions or how they perform in the course or in exams. The study follows the framework of a case study (e.g. Jarvis 1999), i.e it focuses on a specific temporal-spatial practice that is transient, but significant for understanding the minute negotiations and entanglements of practice. Though the study is not conceptualized as an action research project, but as an ethnographic study, it may involve change and experimentation, as the teacher is part of the research group. Thus, in the autumn of 2017 another round of interviews will be conducted to follow up on the results described in this paper, and to analyse changes in the set-up that may arise from reflections on the research.

In following students’ activity in webinars, seminars and group sessions we have engaged in multi-sited ethnographies, which have enabled us to trace significant sociomaterial connections both within and across these arrangements of
learning (Marcus 1995, Sørensen 2008). Observations have been made both through participation in seminars and webinars and through recorded material (e.g. group session with a teacher), the latter being a non-participatory form of observation that is also non-interventionary. Interviews with students have been made in focus groups to follow students’ negotiation of how specific practices generate activity. 

4. Learning in the student activity model

The student activity model is a framework used since 2013 by University Colleges in Denmark to identify ways in which students are expected to learn during their bachelor education (e.g. as a nurse, teacher or social worker). The aim of the model is to visualise varieties of learning strategies in which students and teachers can be active and relate to each other in different ways, i.e. not only through ‘instructional’ relationships between a teacher and groups of students.

In the activity model, participation is understood to be distributed between four categories that are to some extent either instructional or student centered. The four categories are 1) activities initiated by a lecturer that engage both students and lectures (e.g. classroom lectures, guidance) 2) activities initiated by a lecturer that involve only students (e.g. project- and group work) 3) activities initiated by students that only involve students (e.g. study groups) and 4) activities initiated by students that involve students and lectures (e.g. student counselling, debate events). What this distribution of activity forms entails is among other things that significant responsibility for learning is placed on students, which is meant to heighten the awareness of students with regard to their own learning activity.

Figure 1: the activity model

In the activity model learning is defined primarily by initiation and participation, and does therefore not in any consistent way consider the role of learning technologies used in education. How materials are implicated in activity, participation and learning is therefore a question that must be investigated through observations of or research in practice. Jelsbak et al (2015) argue that the activity model is a relevant framework for understanding the learning activities in University Colleges and that if the technology works, students can experience that video-mediated teaching is ‘as good as’ face to face teaching. However, as proposed by for instance Fenwick et al (2011), technology does critically shape learning activities, for instance as forms of engagement, dialogue and inclusion in video-mediated environments.

5. Blended learning and the activity model

At UCL there is a strategic focus on supporting and qualifying learning activities through digitalisation (Bertelsen, Jensen & Vognsgaard 2016). The aim of these strategies is to offer education that is both contemporary, flexible and engaging and that allows students to participate and learn across time and geographical space. At UCL, digitalisation therefore becomes part of the activity model primarily by transforming the time-space and material relationships within which
teachers and learners can relate and actively interact. Delivery modes used in the literacy course were, as mentioned above, seminars in classrooms, where students were situated in rows facing the teacher, and where the teacher taught through a smartboard using e.g. Powerpoint, Padlets and webpages. In addition to this, students met in Adobe Connect every second week and also in between seminar and webinar sessions in smaller groups of 3-4 in which they discussed specific texts and tasks with the teacher (in Adobe). Students also had their own sessions in which the teacher did not participate and which were delivered in multiple modes of their own choice (for instance Google Docs, Hangouts, Skype).

Our data show that within the pattern of human initiated activity, multiple connections between human and material actors arise as technologies access and participate in forms of activity. In teacher initiated activities (webinars as well as seminars) technologies such as Powerpoints, Padlets and webpages for instance significantly participate in shaping the learning activities by acting as sites for the display, analysis and sharing of student or teacher knowledge. On the other hand, webinars are not as spatial organisations of learning reproductions of the relationships and activity forms found in seminars. For instance, as webinars are recorded and shared online, students can choose to participate in real time or listen to and view the session in their own time and space. Also, a variety of modalities such as sound and image are used in Adobe Connect to create participation and presence in student initiated group sessions arrangements of learning are more diverse than in the teacher initiated sessions and students tend to use more interactive and social technologies. This creates a number of potential arrangements of student-to-student or teacher-to-student activities that are student initiated. How this affects student activity will be developed and discussed below.

6. Students’ activity in net-based teacher education

Students in the net-based teacher education have actively chosen a bachelor programme in which learning is primarily an online activity. Students underline that in choosing a net education they have prioritised the flexibilities of time and space as well as life-, work- and study relationships that online education offers. What this means for students is for instance that online learning works in dynamic relationships with other activities and are arranged in personalised ways to appropriate changing needs and preferences in students’ lives. As an example of this, one student explains that he needs to work in the daytime in order to be able to afford to study, which is why he has chosen to be a net-student. Another student describes that he is a hands-on person and therefore needs to relate the theory learned at the teacher college to the practice of work.

Whereas flexibility works to create relevant connections between issues that matter in students’ lives, flexibility also challenges ways in which students can be active within the framework of the activity model. According to the teacher, students in the net-based teacher education do not distribute their activities evenly between the activity categories, as they often voice their need for a profiled and visible teacher presence in the course and are generally hesitant to initiate contact with the teacher for individual supervision and guidance. As net-students, they are often separated from the institutional space of the teacher college, the teacher argues, and do not have daily contact with the teacher and other students. Therefore, they require specific forms of scaffolding and community building which, according to the teacher, are often connected with the display of the teacher’s knowledge and authority. In the interviews students corroborate this view as they underline that the flexibility and fluidity of their learning environments requires both self-discipline and consistent interaction with the teacher’s knowledge in teacher initiated sessions. One of the students for instance says that she very much needs the teacher to be present physically in the seminars in order to know whether she has understood what she has studied correctly. Also, students report on their challenges with student initiated activities, especially group work. Taking responsibility and connecting with authority are therefore significantly involved in learning as a net-student, as one student comments, there’s a need for a strong authority in the groups who sets a time and date for our meeting. If not, it comes to nothing. Thus, authority becomes associated with learning activity at the same time as students engage in flexibility as active students.

While students in the net-based teacher programme may not at the outset initiate learning activities, as expected in the activity model, they do however participate actively in reflecting on and co-constructing the learning arrangements made by the teacher. Through evaluation and other kinds of feedback, students for instance reflect extensively on how technologies can be associated with forms of activity. During the literacy course the teacher for instance experiences that the students challenge his assumption that Adobe Connect works well as a space for dialogue that can
complement teacher initiated presentation in classroom based seminars. Contrary to the assumptions made by the teacher, students argue that Adobe Connect sessions can be appropriated to their learning needs, if sessions are primarily teacher initiated and teacher led rather than dialogic. Also, students increasingly conceptualise seminars as learning arrangements that can support dialogue between students and the teacher rather than act as teacher led presentations of knowledge.

7. Activity in arrangements initiated by a teacher

Seminars and webinars are as mentioned above both examples of teacher initiated learning arrangements in which students’ activity is framed within the organisation and rhythm of learning planned by the teacher. These arrangements of learning are also spatial dynamics in which different kinds of materials participate. Our observations show that in the face-to-face interaction of the seminar the dynamics created in the classroom were similar to what Sørensen describes as the co-construction of authority through regional separations in the classroom (2009). In the seminar these regional separations for instance involved the broadcasting mode of technologies such as smartboards and the organization of tables and chairs in the room which drew students’ attention to the teacher’s regional space.

In the webinar, this spatial dynamic of presence and authority was to some extent remediated (Bolter & Grusin 2000) in the sense that regional separations were demarcated in the interface of the online classroom. In Adobe Connect, the interface is divided into different regions of participation and display, which configure students and teachers as active in specific ways. Remediation of authority is for instance performed through the categorisation of attendees as presenters or participants (with the connected moderator rights), and with the modalities of text, sound and video. Thus, participants can be present through turning on their video, raising their hand and speaking through their microphone, through engaging in text-based chat or sharing material or by simply listening to what is said.

However, in the session observed, only the teacher was presented through video and shared material (though this material was sometimes students’ assignments), also the teacher acted as the moderator, i.e. was in charge of admitting students to the session and facilitating discussions as well as organising the spatial set-up of the session. On the other hand, students were primarily present through their attendee names, and through text chat and voice. Of the students listed only half were active through text chat and voice underlining the fact that participation was contingent on a variety of modalities of which sound and text chat seemed to foreground activity and participation rather than just presence. Compared to the seminar, spatial dynamics and activity were therefore clearly entangled with shifts between text, sound and video modalities, which were both demarcated in the sense that the teacher seemed to perform his presence through specific modalities, but also open in the sense that students could shift between for instance chat and voice presentation. In a student initiated Adobe Connect group session observed later by the researchers, the spatial dynamic of Adobe Connect was reorganised to allow students to participate through video as well as text chat and voice, which two of three students chose to do. This visual organisation of the interface gave the impression that students were at a level with the teacher and therefore situated in the region formerly occupied solely by the teacher.
These examples illustrate that in Adobe Connect activity is performed through multimodal patterns of relationships and that these patterns of activities - though teacher initiated - are significantly different from the practices of seminars. This highlights the agencies of not only students and teachers, but of material relationships in education.

8. How recordings participate in teacher initiated webinars

For students, engaging with the teacher’s knowledge is often as mentioned above associated with arrangements that are teacher initiated and where the teacher has framed the content and context of the event as well as is visually or physically present to the students (i.e. webinars, seminars). However, in practice, the knowledge of the teacher can be engaged with in many different ways. For instance, though webinars are teacher initiated they may be appropriated to students’ own purposes and learning through recontextualisation and remediation, as Adobe Connect sessions are recorded and therefore accessible to students after class. Kress (2010) argues that the capturing, linking and copy-pasting of text, sound and images has become a naturalized practice of digitalised societies in which users tend to favour selection and transformation of material over production from scratch. What this means is that when captured, life-worlds and other kinds of accessible information can be turned into an artifact and reused or repurposed elsewhere. Thus, captured material can be (re)distributed and shared, for instance through social media, far beyond the locality from where it was taken, often blurring the origin and authoring of material. In this way, as Kress argues, multi-authored chains of semiotic material are created.

In the UCL literacy course teaching through Adobe Connect, according to the interview with the teacher, became a significant site of negotiation between the teacher and the students, as students increasingly came to associate the webinars with the capturing, distribution and repurposing of the teacher’s knowledge. Initially, the teacher had conceptualised the webinars as a space for dialogue with the students and between the students, where students could work with and share knowledge acquired from their reading and group work. However, as the course progressed, students increasingly expressed a wish to redefine the webinars, as recordings of webinars were used by students in their own time to access the teacher’s presentation of knowledge. This for instance, according to the teacher, meant that some students required of other students that they talked less during the Adobe sessions, as they felt that student discussions would interrupt the flow of listening to and viewing the teacher’s presentation of the course content in the recording.

In the interviews students talk about how activity is practiced and evolves in shifting student-webinar relationships where recordings create new ways of engaging in teacher initiated learning. Natascha for instance says that she doesn’t understand why other students would prefer to engage solely with the Adobe recordings and not show up for the live sessions. She herself does access the recorded sessions in her own time and uses them as notes to remember what has been said in the webinars. However, she also always participates in sessions, webinars and seminars alike. For her, participating actively by asking questions in live sessions helps her learn, and as she says about her live participation, if nobody dares ask the dumb questions, nobody will learn, not even those who watch the recording afterwards. Mike, who prefers to participate primarily in the webinars (rather than seminars) as he suffers from travel sickness and lives at a 3 hours’ distance from campus, says that he does not understand why students would participate in live sessions
and not be active, as they might as well then just watch the recordings at home at some other time. Also, he reflects on other students’ and his own choices by saying that I imagine that some students would watch recordings of the webinars first, and then read the course material afterwards. I have tried this myself, but it doesn’t work for me at all. You need to have that contextual knowledge to understand the webinar. The examples given by Natascha and Mike thus illustrate the complexities of practices initiated by the capturing of webinars that in significant ways transform patterns of relationships and consequently student activity associated with teacher initiated learning. How this affects student initiated activity will be discussed below.

9. Activity in arrangements initiated by students

When webinars are transformed into recordings that can be distributed, shared and interacted with in alternate times and spaces, activity is reconfigured through the social framings of the material. For instance, in the example given by Natascha, shifts between listening to the recording of the webinar as a way of remembering and making notes and live participation in webinars where “dumb questions” can be asked are different ways in which Natascha can act as a learner in relation to the webinar. These examples show how arrangements are made that constitute different appropriations of the teacher’s knowledge in which Natascha’s activity emerges as a practice in various ways. By using the webinar as notes Natascha can for instance transform the teacher’s knowledge into a stable object from which she can draw out relevant information by listening to a past learning event. On the other hand, when participating in the live webinar session Natascha can engage with the teacher’s knowledge by asking questions that contribute to forming her own knowledge through inquiry and dialogue in the moment. For Mike, experiments with watching recorded webinars prior to engaging in texts contributes to structuring his reading of the course material, thus reversing the traditional pattern of reading as a preparation for participation in a course. However, for Mike, this way of interacting with the webinar to some extent fails, as he needs the situated understanding, interaction and engagement of live sessions in order to learn.

As patterns of activities these learning strategies are student-centered and student initiated in the sense that students are actively involved in creating the time-space and material relationships in which learning can be practiced. However, in the examples given, these patterns of activities are also primarily related to engaging with the teacher initiated activity of presenting knowledge to the students. This corresponds with students’ need for structured engagements with the teacher’s authoritative knowledge. Thus, by engaging with recordings of webinars students can extend the interaction with the teacher’s knowledge into their own time and space and thereby initiate new patterns of activity and engagement with the material.

10. Conclusions and further work

Our investigation of student activity in a blended learning environment has uncovered a variety of socially and materially intertwined learning practices that can be understood as forms of activity, participation and presence in net-based learning at UCL. Though activity can be defined by the student activity model and by the dynamics of blended learning arrangements, our data show that in practice, patterns of activity are not predictable, but emerge from the sociomaterial relationships in which they are embedded. Thus, student initiated activities emerge that are connected not only to the student defined activities of the student activity model’s category 3, but also to category 1 activities, where video recorded webinars contribute to prolonging and appropriating teacher authority and knowledge into students’ own times and spaces. Similarly, text and video relationships are created (e.g. Mike) that constitute reappropriations and transformations of respectively preparation and course participation activities related to category 1 activities. Finally, activity emerges in a variety of multimodal relationships in which sound, image and different textual practices (e.g. chat, PPT) perform authority and presence in specific ways that are contingent on different learning arrangements. Based on Sørensen’s analysis of the sociomaterial relationships in learning, we can argue that relationships between human and material actors create mutation forms of learning in which activity is not clearly defined within the boundaries of instructional approaches or mediated or blended approaches to learning. Future research in student activity at UCL will focus on expanding our knowledge about these specific emergent and mutating forms of student activity and how they can inspire development and innovation in the design of flexible and engaging learning environments.
11. References


