Mapping Patterns of Relations in an Online Graduate Course: A Sociomaterialist Perspective

Marlon Simmons

Werklund School of Education, University of Calgary, simmonsm@ucalgary.ca

Gale Parchoma, Marguerite Koole

Department of Curriculum Studies, College of Education, University of Saskatchewan

gale.parchoma@usask.ca, m.koole@usask.ca

Abstract

This study explores the patterns of relations that emerged and mutated during a particular semester of an online, graduate course, Multimedia Design for Learning. The assemblage, a learning community, was comprised of a professor-course designer, learners, the course content, digital connectivity, a learning management system (LMS), digital media production software, learning tasks, assessment criteria, and emergent activities. We describe the expected and unexpected relational interplays observed among the actors and map the performativity of the learning community. Within this interplay we were more concerned about how particular nodal points (actors within a network) came to operate as sites of attachments (bonds between actors), and simultaneously promulgated different sensibilities and new relations, which in turn, worked to transform material/digital/human objects into agents. Our main interest was to better understand how, from an initially fragile assemblage, an online learning community could emerge, reconstitute, and/or dissolve. We first describe Sørensen's (2009) patterns of relations (regions, networks, and fluids) metaphor. Then, we consider the shaping, reshaping, and co-constitution of the patterns of relations (Mol & Law, 1994). We also describe the role of obligatory points of passage, and sites of attachment that held the assemblage's network together. Our methodological approach drew upon Hine's (2000; 2004) principles for undertaking a virtual ethnographical study. In order to gather our data, we conducted online, structured, asynchronous, text-based interviews with seven of the fourteen course participants. A second data set was derived from the course designer-instructor's (also a co-author here) reflective notes. As a research-group, we spent reflexive time constructing and applying a guiding conceptual framework for data analysis. We engaged in two rounds of coding. The first round was descriptive; the second round was self-reflective. In this paper, we focus on key themes that describe student-participant's chosen sites for: 1) finding familiarity/continuity in the processes of navigating synchronous and asynchronous communication channels and associated resources initially chosen by the instructor, (2) finding ways to collaboratively engage in knowledge construction within the course, and (3) circumventing the patterns of relations initially implemented within the course design. We conclude the paper by discussing how initial attempts to create spaces for specific patterns of relations ("design choices") appeared to evolve within the learning community assemblage; that is, how activities emerged unexpectedly.

Keywords

Sociomaterialism, network learning, online education, mapping relations

Introduction

This study examined the social topology that emerged within one section of an Educational Technology and Design (ETAD) course, *Multimedia Design for Learning*. Within the sociomaterialist perspective that we took in this study (Sorenson, 2009; Decuypere, & Simons, 2016), a social typology arises from recursive performances of similar and differing social practices in response to moving between recognizable (potentially stable) and unfamiliar (potentially unstable) environments (Law, 2000). In surveying recent participants in the course, we focus on tracing instances of relations that occurred between human and non-human actors as they

engaged in relational social practices that enacted an online learning community into being. We define social practices as effects that are generated by relational interplays among actors.

Through this small study, we hoped to better understand how the design of the course within the governing online environments affected the patterns of relations amongst the students and other actors (human and non-human). We draw on (Goodyear, Carvalho, & Bonderup Dohn's, 2014) proposition concerning design, that:

> The knowledge needed for design includes ways of knowing that can draw logical connections between physical things and physical things (T-T), human beings and human beings (H-H), and human beings and physical things (H-T). This is in addition to understanding such matters as the experience of learning and connections between learning activities and likely outcomes (the classic domain of learning theory), p. 138.

Guiding the study was the question of: *How and what are the ways in which the patterns of relations performed and recursively emergent within the socio-material environment of an online graduate course?*

Research context

Multimedia Design for Learning is offered at least once per academic year to Masters students in the ETAD program at one western Canadian university. The course has been offered for several decades and in the process it has evolved from being situated in design approaches for classroom-based teaching and learning focused on production of analogue media to a fully online teaching and learning environment that focuses on production of digital media. Across this time period the course design has undergone several phases of redesign and has been taught by a series of faculty members. Through these iterations, the basic course structure has remained stable in that there remain five short modules, each of which includes a small media production task, then concludes with a final project where students are required to produce an interactive multi-media resource they can share with others (e.g., K-12, higher education, of informal groups of learners). The resource needs to be designed with a view that knowledgeable others in the field of interest must have sufficient information on how the resource can be used so that they will be able to use it in or adapt it for differing contexts. The course design includes seven online modules, each of which is populated with a range of text and multimedia resources that learners can access asynchronously. In the most recent course redesign, relevant resources from previous designs were reused or updated. New resources were added. The University has a licence for Lynda.com: a commercial, professional provider of media production training that uses YouTube-like videos on how to produce various media. Where the Lynda.com site provides opportunities for skills training, the Multimedia Design for Learning course provides content on design principles and production criteria. The synchronous components of the course are made up of three instructor-led two-hour sessions: (1) a course overview, (2) peer and instructor reviews of draft work, (3) student presentations of completed final projects, interspersed with optional weekly one-hour "coffee sessions," where the instructor and peers are available to provide feedback on early draft work. In addition, there was a discussion board that was organized into general (open) discussion threads for each module and semi-private studio group threads for triads of students to work together asynchronously on refining draft work. Each assignment was submitted twice via the discussion board. The first submission is a near-finished draft, on which studio group members provided feedback and the instructor provided a formative assessment. The second submission is the final version used for the instructor's summative assessment. While studio groups were organized to provide a workable division of labour, the studio group threads were also open to all class members if they chose to access them. Student-participants in the study not only made use of each of the built-in communication and interaction tools via the course website, but they also used external/social media to communicate and interact outside the course website.

Guiding conceptual framework

We embrace a relational approach to the myriad interconnected practices of teaching and learning in synchronous and asynchronous online settings. Our aim was to understand how entities became enacted through these indeterminate social and material relations and what were the ensuing effects of their distributions. The assemblage, as aforementioned, embodies a professor-course designer, learners, digital connectivity, a learning management system, and tasks designed to promote specific relational interplays among actors. We were also cognizant of mapping how these sites of attachments came to be continuous, fixed, stable, made permanent, and at the same time fragmented with brittleness (Latour, 2005; Mol & Law, 1994; Law, 2002; Orlikowski, 2000, Fenwick & Edwards, 2010).

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Drawing on the works of Law (2000), Mol & Law (2004), and Sorenson (2009), we set out three dimensions of a social typography to organize our analysis: (1) regions, (2), networks, and (3) fluids. We defined regions as spaces where variables are averaged and fixed among stable networks. For example, a regional space is one where routinized practices are performed in predictable ways that are defined by familiar protocols. Stable networks hold regions together. Networks are composed of invariable links, which can be analyzed across a range of scales (Law, 2000). For example, an online course may be viewed as an assemblage of many human and non-human components that are in constant interaction: learners, instructor, IT support staff, librarians, computers (CPUs, keyboards, mice, speakers, microphones, etc.), monitors, digital communications networks (WiFi, cellular), learning management system (comprising reading content, asynchronous discussion forums, internal/external links, wikis, journals, chat, etc.), and synchronous discussion tools (such as Adobe Connect, Blackboard Collaborate, WebEx, etc.). Altogether, these components can be considered a single region (the "online course region").

Within the online course region, the individual components just listed can be viewed as regions ("micro-regions") in themselves. The micro regions are connected together through networks. Networks can only be stable as long as their "entities hold steady" under challenging and changing circumstances (Law, 2000, p. 93). For example, the learner-micro-regions and instructor-micro-region rely upon each others' roles (network configurations) to maintain stable sets of behaviours. Changes in behaviours may result in a breaking down of the roles, which might lead to a change in the overall configuration of the network. Changes in the ability to connect through WiFi or cellular would impede interaction. So long as the network configuration remains stable, the participants can continue to enact their roles.

Fluids flow in and out of networks and while they threaten their stability, they also create spaces for the emergence of new attachments. Fluid aspects of an online course could include changing content (such as through broken links, readings becoming un/available) or the coming and going of guest speakers and/or IT support staff. These elements will not necessarily alter the network configurations, but their presence involves some permeability of the online-class-boundary. Gaining entry into the online-class-boundary relies upon certain obligatory points of passage (OPPs) such as official recognition of one's role: student, instructor, support staff, official guest.

Regions can "fold" when they begin to share networks. For example, when a learner discusses his/her prior knowledge of a subject area, s/he is folding together knowledge from different times and places. The folding is a space of knowledge co-creation; the characteristics of such a space is as unique as the regions, fluids, and networks that comprise the online course region. See Figure 1 for our overview of relations among regional, networked and fluid dimensions.
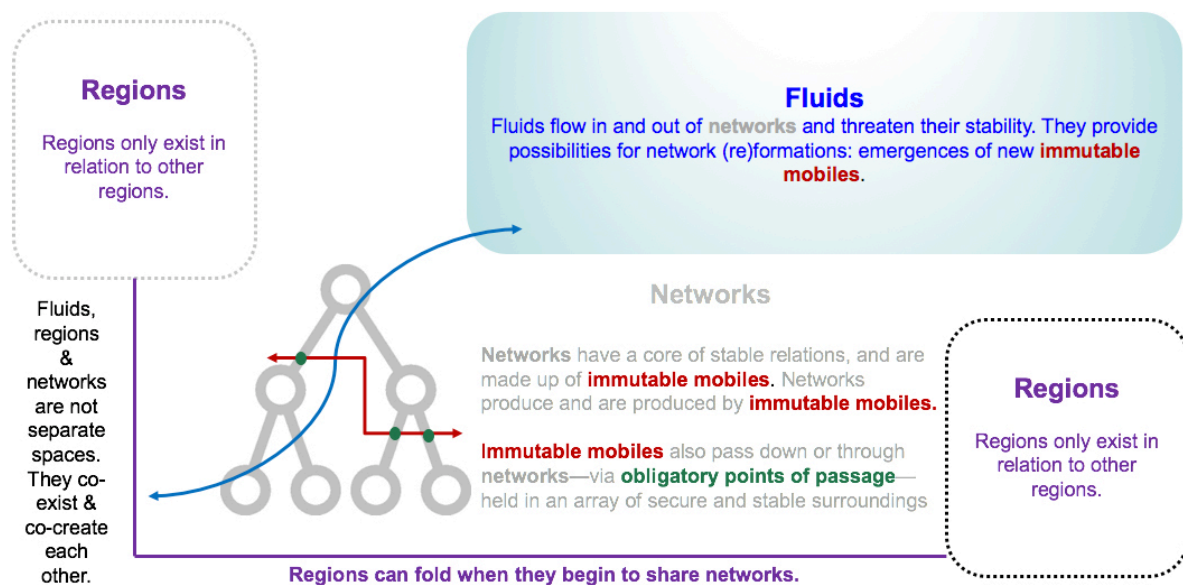

Figure 1. Regions, networks, and fluids

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Methodology

Ethnography has long been integrated within educational research to understand various complex settings of human inquiry. It has historically been concerned with the researcher interpreting culture as residing in the everyday experiences of people over an extent of time. Our matter of concern with this inquiry was with mapping particular patterns of relations through human and material entities as they came to form dynamic assemblages within an online graduate course. In this discussion, the sociomaterial is situated as a cultural place, which brings a host of methodological limitations and possibilities for meaning making in virtual realms. With these acknowledgements in mind, ethnography is of interest as it allows for better understanding regarding how people collaborate to learn in varied online contexts. The online context opens different ways of knowing strategies or approaches necessary for ethnographic inquiry.

Part and parcel of virtual ethnographic engagements involves the signification processes embedded through the material and non-material interactions as governed within the spatial spheres of synchronous and asynchronous modalities. Our ongoing ethnographic tasks are with mapping the ways in which interactions come into being and simultaneously constitute communities of learners and collaboratively enhance student learning. In particular, we are concerned with how these interactions become enacted through certain nodal points and simultaneously how through recursive practices, which constitute learning, these material nodal points come to mediate meaning making possibilities.

Our approach to the research design drew from Hine (2000; 2004) principles of virtual ethnography. Being educators who mainly work through online environments and actively engage teaching and learning practices within synchronous and asynchronous modalities, we are concerned with the particular knowledge making processes, which take into consideration the sensibilities of relations with human and non-human entities and how they become constituted into meaning making subjects within online determinants. We mapped what, or who, was being related to and how this is being done. Which actions are performed and which relations make it possible that such actions are performed? How do relations between actors in a particular setting have specific effects on these actors themselves? And how do identifiable communicative relational constellations generate specific sorts of effects that can enhance teaching and learning? These communicative exchanges open limitations and at the same time myriad possibilities for virtual ethnography. Given the pliability of synchronous and asynchronous spaces, temporally situated interactions, coming to frame the ethnographic field is always already ongoing, fluid and nuanced with diverse dynamics.

Data collection

Denoting what constitutes data within virtual ethnography involves a hermeneutic task of sifting through the human and non-human interactions that collaboratively enhance teaching and learning practices. To interpret these dynamic interactions, we drew from two sources: online, text-based structured interviews distributed via an email link to a fillable e-form to gather the data and reflective notes derived from the course designer-instructor's (also a co-author here). In this way, participants were assured anonymity and it allowed the research team to get short answers, rather than essays. We also assured participants of a limited expectation [e.g. a maximum of one hour] for the duration of the interviews. Questions addressed the what, how and why of student experiences in the course. We also drew from the instructor's reflective notes on what happened during the course, and self-reflexive oral narratives concerning course activities to make sense of, how as a research team we developed a shared understanding of the phenomena under investigation, which is, how design choices influence the learning experiences of graduate students on the online course, *Multimedia Design for Learning*.

Data analysis

We did two rounds of coding for the data analysis. This process involved ongoing discussion inclusive of individual and collaborative coding. The first round of coding was framed in two moments. By way of a descriptive element as well as dialogue through self-reflexivity, we came into a collective understanding of the guiding research question: *How and what are the ways in which the patterns of relations performed and recursively emergent within the socio-material environment of an online graduate course?* For the second round of coding we organized analytical codes through a relational reading of the literature review to note similarities, differences and extensions. By way of an iterative process with the research team, we articulated three themes that delineated the how, what and why of the recursive practices as governed by negotiating artefacts of the social and the material, the human and the non-human within the online learning community. Extricating the three themes was made possible by way of thinking through our conceptual framework concerning sociomaterial approaches to networked learning.

Findings

After the two rounds of coding, data analysis and collaborative self-reflexive discussions with team members, three themes were identified. They were:

- Quests for familiarity/continuity
- Sites for collaborative knowledge construction
- Emergent activities

Across themes identified in our findings, participants noted how relations were formed within and beyond particular communication modes. Student-participants' became attached to particular sites: (1) sites for generally supporting each other's efforts, (2) sites for helping when one student-participant needed help in an area in which someone else had strength, (3) sites for knowing if other students were online or not and whether there was an opportunity to have a "chat" style discussion, or (4) sites for coming to know other students' expertise through critiques (peer reviews) and/or then seeking out a reviewer or a reviewee's advice.

Quests for familiarity/continuity

The search for the familiar, that is, for continuity with other educational experiences seemed to be an existing presupposed sensibility, which worked to inaugurate patterns of relations. In that, predetermining the conditions for online learning was the folding of three regions: (1) student-participants' experiences within the current online course design, technological artefacts, and relations with peers and the instructor, (2) student-participants' generalizations of previous classroom-based &/or online learning experiences and, (3) student-participants' generalizations of previous experiences of using digital media. Student-participants became attached to particular sites: (1) sites for generally supporting each other's efforts, (2) sites for helping when one student-participant needed help in an area in which someone else had strength, (3) sites for knowing if other students were online or not and whether there was an opportunity to have a "chat" style discussion, or (4) sites for coming to know other students' expertise through critiques (peer reviews) and/or then seeking out a reviewer or a reviewee's advice.

Sites for peers and the instructor to generally supporting each other's efforts
Participant 1 stated that she/he felt that the instructor and the members of "our class did a great job of supporting each other" and she/he felt especially "really got a lot out of the [synchronous] Collaborate sessions. "Participant 2 found it easy to use the synchronous and asynchronous communication modalities "to communicate either by voice or typing," but he/she also found the text and multi-media based broadcast resources were "essential for completing assignments." Participant 3 stated that she/he appreciated the ability to "chat about the assignments using the audio [synchronous] feature" with both peers and the instructor. Participant 4 particularly valued opportunities to "talk in real time (via ongoing [asynchronous] text and periodic [synchronous] audio)" with both his/her peers and the instructor provided within the course website. Participant 6 stated that she/he wanted to "talk with the instructor and the scheduled synchronous sessions provided those opportunities. Participant 7 echoed this sentiment and went on to say, that "2-way communications… during the live [synchronous] session(s) was easy. However, Participant 7 also noted an unmet preference for "a Skype style platform" to replace the existing Blackboard Collaborate software that was used for synchronous sessions. This range of perspectives from used to recommended sites for general peer and instructor supports via particular, combined, and/or suggested modalities for communication channels suggests variant levels of experiences and familiarity with technologies within the design. The range also indicates a quest for communicating in ways that are contiguous with previous communications and/or online learning experiences with which learners were familiar.

Student-participants found it easier to communicate in specific types of asynchronous fora. The smaller and over time familiar spaces of the studio groups made them a more comfortable spaces, which allowed for types of social and academic presences conducive for student learning.

Three questions emerged: 1) How do the ensuing relations of familiarity forming this social and academic presence come to be constituted through the social and the material? 2) How do student-participants come into agency through familiarity with synchronous and asynchronous spaces? And 3) what is the role of trust-building with allowing agency to emerge? Student-participants did not evenly share these sensibilities as some constant enactment. As a matter of concern our sensibilities broached how boundary crossings came to be recursive, how regions evolved and given the heterogeneity of studio groups as a bounded region with porous boundaries, what then are the possibilities for dissolution. Some student-participants were new to the peer review processes.

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Being recorded saw questions of vulnerability arising. During the studio group review process, student-participants' shared their understanding with particular performances of detachment and attachment. We also thought of what set of arrangements were being formed and enacted through critique. We pondered if student-participants felt bound within a particular region. And if moving outside of the bounded region could have involved an unknowing, a type of de-familiarization as imbued through technological mediation which worked to disrupt familiar student-participants' ways of engaging in conversation What then are the kinds of relations and sensibilities involved with materializing such discontinuities?

Sites for collaborative knowledge construction

Identifying the theme, sites for collaborative knowledge construction, provided another organizing principle with making sense of how emerging patterns of relations were performed and made durable through recursive practices in the online graduate course. Three points of relations were noted when identifying this organizing principle: 1) Blackboard resources, studio group peer and instructor reviews of draft work and assessment rubrics which formed itself as obligatory points of passage; 2) voluntary and "required" synchronous collaborate sessions for real-time peer review and instructor reviews of draft work and recordings became enacted as points of attachment; and 3) Alternate channels: e.g. Google Docs, Skype, though loose and fragile were enabled as mobile modalities for learning amongst members of some studio groups.

Again, additional questions arose: 1) What is it about Skype that made possible ritualized practices with course materials? How and what are the ways in which Skype becomes a mode of attachment? 2) What ways of knowing are rendered when student-participants engage a tool they are familiar with, made autonomous and constituted through a synchronous arrangement and preconditioned through its continuity?

During the audio of sessions, microphone check-points became an activity, which inspired use of technology and participation. The way that the microphone check was engaged created modes of attachment. It allowed for a type of playfulness, a type of light-hearted way of reflecting on student learning, one productive of desire and replete with curiosities regarding course engagement. Rather than something they had to initiate, it was implemented into the design and came into being through one-to-one relations with the professor as a normative practice. Participant 1 commented that she/he was first:

> More afraid to speak up. I think it helped that [the instructor] had everyone do a mic check at each beginning. I may not have used the mic otherwise. She may have regretted that haha!

What we are suggesting, is that during the microphone check-points, a pedagogy of humour as engendered by the instructor, enacted certain actions that conjured knowledge construction modalities. We were also reminded of the pedagogical necessity to map our own teacher-student interactions that come to situate learning, in a manner, that in and of itself constitutes its own assemblage, its own dynamic, its own region, which folds and becomes bound in particular ways. Our challenge with a sociomaterial approach is with making intelligible, the manner in which the assemblage appears and made durable in ways that enhances student engagement in the online context.

Individual preferences and previous learning experiences also played a role in forming sociomaterial relations. Participants 1, 2, 3, 5, 6, and 7 each emphasized the importance of the synchronous audio sessions. For example, Participant 1 commented:

> I appreciate that [the instructor] gave us the option of attending every week. I felt a boost of inspiration to get at my projects after every session.

Participant 2 noted that "The collaborate sessions were good to get input from other peer students and get questions answered." Where Participant 3 noted that she/he "enjoyed our collaboration times when we could communicate directly…I had more immediate feedback;" she/he added that, "using Blackboard was helpful for a feedback at your own pace." Participant 5 commented that the "Blackboard Collaborate sessions where we discussed our projects with our group members and received feedback were most useful." Participants 4 and 6 could not attend the optional audio sessions because of scheduling conflicts. However, they listened to session recordings "each week," and then posted follow-up thoughts on the asynchronous discussion board:

> I found the discussion board so helpful. Not only getting feedback on my assignments but being able to offer feedback on others had me thinking critically. (Participant 4)

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The Collaborates not only answered questions and provided clarifications but also build a sense of community within the class in my opinion. (Participant 6)

Sites for helping when one student-participant needed help in an area in which someone else had strength

Student-participants in our study identified studio group communications (in particular, as a way to identify recommendations for how to use particular media production technologies and their features). While the asynchronous text-based studio group discussions were intended to support triads of students in peer review processes, these fora were not strictly private. Anyone in the class could read (and even respond to posted draft work and studio group reviews). This design within the course was intended to be an optional way for individual learners to engage with non-studio group peers in order to gain insights into what additional peers in the course were doing and discussing. Participant 4 noted that both the studio group fora provided opportunities to "get feedback" on draft work and "offer feedback on others'" draft work, which resulted in his/her "using the [assessment] rubrics several times" and this process provided opportunities to also check on "other people's feedback (for feedback [from] people not in our studio group" and he/she "learned a lot from that." Participant 2 commented that she/he "I was able to understand and learn some new principles for supporting others' learning."

Sites for coming to know other students' expertise through critiques (peer reviews) and/or then seeking out a reviewer or a reviewee's advice

Through being able to access peers' draft work and both peer and instructor feedback on draft work both in the asynchronous studio group threads on the discussion board and during synchronous audio sessions, student-participants were able to review studio group members and other peers' sets of expertise. This ability led to seeking out connections with more knowledgeable peers for support in their own efforts. Participant 4 noted that he/she "learned a lot from that." Participant 5 noted that engaging in the course tasks "introduced us to a variety of skills that could be applied to support learners in many different settings." Participant 6 remarked that she/he became:

A proficient multimedia developer. Not only did I learn how to create using different programs I feel I learned how to learn new programs/techniques.

These latter two sites became opportunities for collaborative knowledge construction, and where participants drew from previous understandings of instructional concepts. As participants increasingly engaged in social suasion to encourage peers' participation in these emergent activities, these site became somewhat obligatory. These sites of attraction for students were desired, and performed accordingly through a range of different perspectives, based on both expectations arising from previous learning experiences and recognition of new ways of reaching desired goals.

Emergent Activities

Emergent activities also enabled patterns of relations through specific choices of the student-participants as experienced in the chat room. The emergent activities were fluid, flowing in and out of networks and regions, threatening stabilities, as well as, providing possibilities for network (re)formations and emergences of new attachments for teaching and learning. We found student-participants gathering anticipated &/or unanticipated attachments inside &/or outside designed inscriptions as embedded in the course.

Sites for knowing if other students were online or not and whether there was an opportunity to have "chat" style discussions

Student-participants soon learned that via little green dot beside active student names on the course website, they could identify when their peers were online. Noticing those little green dots or even have a peer immediately reply to an asynchronous post allowed them to have real-time "chat-style" discussions (Participant 7) either using available tools within the course website or agreeing to chat via social media, such as, "Google docs" (Participant 3). Communicative exchanges by way of voice or text used to interact were desired with immediacy and made possible through particular distinctions by student-participants. In problematizing these distinctions, we found that there existed a pedagogical necessity for student-participants to communicate at the same time and not disrupt the voice of the instructor or other student-participants. The chat room provided a place for ongoing asynchronous capacity within a synchronous space. It situated the learning of student-participants in relation to particular virtual practices. "Chat" here speaks to informality less available in the

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discussion boards, a folding of a region, a place for text and voice to interact. Yet, privatization of text also denoted guarded regional boundaries and points of attachment for enhanced student learning.

Conclusions

In thinking through sociomaterial approaches to better understand designing, teaching and learning implications in online environments, we are cognizant of the limitations of being able to design someone else's learning. Our sensibilities are more in sync with (Goodyear, Carvalho, & Bonderup Dohn's, 2014) idea of, "the best we can do is create thoughtful designs *for* learning". The social typology for an online course emerges as a series of individual and social practices embedded within complex combinations of: constraints, compliances, attachments and dis-attachments, circumventions and alternative communicative channels. Our challenge concerns inscribing potentialities into course designs to allow for multiple assemblage formations that can help with situating different learners in the complex virtual continuum. Designing, teaching, and learning are emergent, negotiated activities and we can be creative factors in the process.

With the interrelationships among regions, networks, and fluids in mind, we elucidated obligatory points of passage, which rendered learning networks possible in our online learning environment, insofar as these networks, in and of themselves came into being through the constitutive effects of multiple regions enacted through particular fluid acts. Often, we were paying attention to the ways in which these regions congealed and yielded themselves through fluid seamless arrangements. We noted instances where boundaries came to be drawn around regions. We suggest that regions, networks, and fluids ought not be thought of as separate entities in a totalizing way, but more so forming coterminous grids with porous seams. Of importance to the generative aspect of networks is the way in obligatory points of passage and varied points of attachment come to be enacted within the fluid spaces of synchronous and asynchronous modalities. We sought to trace how do fluid spaces, circulating through regions and networks, come to coexist and come to be productive of continuous distributive relations, and how particular distributive relations come to be situated as obligatory routes within the governing network.

We conclude with some key observations: 1) the choice of tools (and other elements of the assemblage) permits a variety of patterns of relations; 2) as learners engage with the assemblage, their needs, desires, and activities co-structure the assemblage, and as such, the development of broad and/or sub-groups will emerge; and 3) rigid adherence to specific tools in an attempt to enforce certain patterns of relations may result in learners circumventing spaces thereby resulting in unexpected activities.

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