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Title contribution: A discursive-material perspective on learning design and pedagogic agency in three edX MOOCs.

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Introduction

Design and learning design are often dealt with as deliberate or intentional processes, conceptualized as the “deliberate shaping of form in response to function” (Mor and Craft 2012, 86) or as “an act of devising new practices, plans of activity, resources and tools aimed at achieving particular educational aims in a given situation” (Mor and Craft 2012, 89) .

Such instrumental or intentional notions of design assume that pedagogic agency somehow pre-exists the tools and platforms through which it operates. In this paper we propose an alternative perspective. We understand agency and design as outcomes of a process whereby teaching team members reflexively engage with the affordances and limitations of techno-pedagogical platforms.

We propose to consider learning design as an outcome of partially reflexive attempts to weave the constitutive elements of a MOOC into a coherent project, drawing on relational and discursive-material perspectives on agency developed in the fields of communication, science, and technology studies. Agency emerges through articulations of educational objectives, technological affordances, discursive, and institutional realities. It can be understood as a limited but productive ability to (re)configure aspects of discursive-material reality.

In this paper we aim to demonstrate that pedagogic agency and design decisions emerge as teaching team members knot (themselves into) their MOOCs with varying degrees of reflexivity. The metaphor of MOOCs as discursive-material knots is key to the analysis presented here.

To demonstrate the value of our relational and discursive-material perspective on MOOCs we will present analyses of interviews conducted with teaching team members of three SSH MOOCs. These MOOCs differ in terms of subject matter and in terms of the pedagogical approach. These MOOCs were not developed with formal learning models in mind, but this does not mean that their teaching teams did not reflect on the design of their courses. As we will see, they were highly aware of the possibilities and constraints offered by the edX dispositive, as well as of its impact on learning design decisions.

Our interviews did not explicitly address learning design. They focused on the conceptualization of MOOCs and the role attributed to the forums. Our interviews focused on: (1) the reasons teaching teams have for designing a MOOC; (2) the pedagogic ideas they would like to put into practice; (3) evaluations of the edX dispositive and its components; and (4) forum uses and functions. As such, the interviews contain a wide range of highly reflexive post-hoc statements on the way teaching team members conceive the design of their MOOCs, the overall edX dispositive, and their agency with respect to both.

Classic discourses on design in teaching, education, and e-learning:

Simon described design as a process of rational decision making intended to change something from how it is to how it “ought to be”: “Everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Simon 1969, 111 cited in Warr and Mishra 2021, 2).

According to Schön the design process involves “reflection-in-action”. This type of reflexivity operates at a tacit level whereby designers continually adapt themselves to their changing environments (Schön 1992 in Warr and Mishra 2021, 2). Reflection-in-action refers to the way professionals think during practice. Schön developed the notion to emphasize that “unique and uncertain situations are understood through attempts to change them, and changed through the attempts to understand the situations” (Tracey and Baaki 2014, 2).

For Schön, reflection-in-action allows designers to deal with “situations of uncertainty, instability, uniqueness, and conflicted values that are inherent in ill-structured problems” (Tracey and Baaki 2014, 2). Reflection-on-interaction refers to post-hoc interpretative practices (Carpentier 2017; Zienkowski and Lambotte upcoming). Reflexive awareness in design involves an awareness of others, but also a creative process of generating and testing ideas, and a continuous adjustment of practices based on results. According to Hauge design is therefore both “reflexive and emergent; it is the integration of knowing and doing” (Hauge 2014 in Warr and Mishra 2021, 2).

Research on teachers and design has expanded significantly in recent years. Possible reasons include: “the wide application of design to other non-traditional design fields”; “a

push for integrating technology into the classroom”; and the “adoption of 21st century learning pedagogies” (Warr and Mishra 2021, 2–3). In the field of e-learning solutions such as MOOCs the notion of design has been introduced to develop a framework for thinking the “deep, systemic changes that can truly impact education” (Mishra, Scragg, and Warr 2018, 1363).

Design discourses in the field of e-learning focus on the artifacts (e.g.: materials; tools; websites; software; video’s), the processes (e.g.: lesson plans; curricula; instructional design), the experiences (e.g.: sequencing; activities; events; learning communities), the systems (e.g.: non-profit / for-profit; registration; payment; certification and payment systems), and the cultural aspects (e.g.: perception of technology and education; open vs closed mentalities: values; mind-sets; ways-of-being) involved (Mishra, Scragg, and Warr 2018, 1364).

It is therefore not surprising that the literature on design and educational technology is becoming increasingly interdisciplinary, and to complicate things, the discourse on teachers and design is marked by a lack of clarity regarding key concepts. Similar terms such as ‘learning design’, ‘curriculum design’ or ‘design thinking’ are sometimes used as synonyms, while other authors use the same terms to designate different things (Warr and Mishra 2021, 2).

Warr and Mishra identified ten strands of discourse in the literature on teachers and design, based on a co-author network analysis and interpretive content analysis. In these strands the notion of design is approached in the following ways (Warr and Mishra 2021, 8):

1. Teachers as designers: *teaching is design* - summative descriptions of teachers as designers
2. Learning design: *patterns for learning* – creating lessons or lesson patterns and creating a common design language to enable sharing
3. Collaborative curriculum: *creating curricular reform together* – teachers work with each other, researchers, and subject-matter experts to create new curricular materials
4. Participatory design: *Making-sense together* – engaging diverse stakeholders in projects to disrupt power relations
5. Design thinking: *Design epistemology* – design as a type of thinking and learning
6. Pedagogical design capacity – *Adapting tools* – how teachers adapt tools to local context
7. Learning by design – *Design pedagogy* – teaching for multiple knowledge processes

8. Reflective DBR – *Process research* – researching the process of teachers developing an artifact

9. Design for teaching and learning – *Facilitating learning* – designing situations for learning and adjusting in context

10. Design for learning – *Settings for learning* – Designing the teacher role, objects, and activities to enable learning

Our discursive-material perspective on learning design and agency in the context of edX MOOCs can be understood as a response to the call of Mishra, Scragg and Warr to develop “new kinds of research paradigms that allow fluid movement across the levels of discourse” (2018).

Why we need a discursive-material perspective on MOOC design

MOOCs are not the seemingly neatly defined online environments that learners encounter upon registration. They are heterogeneous assemblages that reflect and embody the heterogeneity of larger MOOC dispositives such as edX or Coursera. We follow Kelkar who understands the edX infrastructure as an “assemblage of people (engineers instructors, researchers, even learners), software, and institutions (edX, its partnering institutions, its open-source community) that produce the interactive courses as well as the knowledge claims about good teaching and learning” (Kelkar 2018, 2632).

MOOC platforms can be understood as dispositives that articulate linguistic and non-linguistic practices, semiotic and material elements. Like other dispositives, they are presented as responses to discursively constructed societal ‘urgencies’ (Bühmann and Schneider 2008; Caborn 2016), i.e., the need to adapt higher education to the digital age. Media dispositives such as EdX target both the behavior and self-understandings of subjects. Such dispositives provide limitations and possibilities for agency and social practices, as their material features and functions impact on the production, distribution and reception of contents (Meier and Wedl 2014, 419–21). E-learning dispositives create techno-pedagogic environments through complex articulations of symbols, technological elements and social relationships (Charlier, Deschryver, and Peraya 2006, 470–72).

Teaching dispositives such as edX do not determine the agency of actors in a unilateral way but function by allowing a degree of autonomy and reflexivity to both teachers and learners. Our analyses show that teaching team members that develop MOOCs are by no means structural dopes. The autonomy of teaching team members can be observed in reflexive learning design decisions in practices related to the *scénarisation* or design of learning activities (see Peraya and Peltier 2012).

Nevertheless, educational platforms such as edX shape and preconfigure organizational roles and the division of labour in educational contexts. This pertains to the design of the platform as well as to the design of specific MOOCs. According to Kelkar the transition of edX to a platform model has significant implications for pedagogic agency and the notion of pedagogy itself (Kelkar 2018, 2633–42).

Based on a two-year ethnographic study conducted at edX, Kelkar shows how before 2013, the organization saw itself as an educational institution. Its management envisioned a whole host of edX Fellows, “who worked with the instructors at edX’s partnering institutions and served as the go-between between the instructional teams at universities and the edX Engineering team” (Kelkar 2018, 2634). EdX Fellows were supposed to be subject-matter experts, software-experts as well as well as pedagogy experts (Kelkar 2018, 2634). They often held PhDs and imagined their job as “reinventing existing course material through inputs from the educational literature”.

In practice, learning engineering and pedagogical innovation often took a backseat, especially as edX struggled to sustain itself financially. In 2013, edX opted for Coursera’s business model. It transitioned to a platform with “standardized software features that instructors at partnering institutions could use autonomously without assistance from edX itself” (Kelkar 2018, 2636). EdX built a graphical user interface (GUI) called Studio in the second half of 2012. This has serious implications for course design (Kelkar 2018, 2636):

“Using Studio, and with support from their home institutions, instructors can design the course as they like without much contact with the edX organization. They choose from a standardized list of course components (lecture videos, different kinds of assessments), to create, modify, and maintain a course. If instructors can write code, or have access to developers who can, they can also modify these course components or create custom ones; however, most instructors I observed did not do this” (Kelkar 2018, 2636–37)

For day-to-day support instructors became dependent on their home institutions. The role of edX Fellows transitioned into that of project managers, relationship managers, channel managers, and so on. They all became member of a “Services” organization. Their job became more about management, sales and strategy, and less about pedagogical innovation (Kelkar 2018, 2639). Instructors – members of teaching teams – were now conceived of as *users* of edX software hosted on eX.org rather than collaborators who shaped – or designed – both the software and the instructional material (Kelkar 2018, 2638).

The effect of Studio on the pedagogic agency and design options of learning teams is therefore ambiguous:

“Course teams, as users in the platform model, lost the power they had earlier to demand special software features for their courses, but they gained in that they could use standardized course components to build courses in line with their own goals and purposes with minimal assistance from the edX organization. They gained a measure of autonomy while also being subjected to a set of constraints. How the architects at edX heed the demands of their course teams is very much a function of the course team and its home institution’s standing and power within the ecosystem.” (Kelkar 2018, 2638)

Most of the instructors Kelkar talked to in the context of his two-year ethnographic study were quite content, even if certain users chafe at their voices not being heard by the platform architects. This is a consequence of the construction of edX as a platform with a bureaucracy of project managers who can deny access to the edX Engineering team (Kelkar 2018, 2640–41). In this paper, based on our interviews with teaching team members of three edX MOOCs, we demonstrate that members of teaching teams are quite aware of the fact that their imbrication with(in) the edX dispositive impacts on their pedagogic agency and overall course design.

MOOCs and MOOC dispositives as discursive-material knots

EdX courses are knots of discursive and material elements that afford, invite, and pre-configure forms of agency (Carpentier 2017). At the same time, agency emerges as teaching

team members articulate themselves with the discursive-material knots that are MOOCs and MOOC dispositives. To advance this thesis a few words are needed regarding the concept of a discursive-material knot and its impact on learning design and pedagogic agency.

The knot-metaphor pushes us to analyze the way articulations of disparate discourses, technologies and other material elements *afford*, *invite* and *pre-configure* particular forms of agency. Discourse and matter are not to be thought of as separate modes of existence. The different components of a MOOC may gravitate towards the material or to the discursive (see Cooren 2020, 12). Elements gravitating towards the material would include the technical infrastructure (e.g., software, hardware), as well as the institutional context in which the MOOCs are being developed (e.g., supporting services, university policies and pressures). As we will see, several interviewees talked about a lack of recognition for the workload that goes into surveilling and updating MOOCs after their initial development. The institutional context impacts directly on the motivation and ability of MOOC teaching team members to maintain a high degree of involvement in the MOOC. The architecture of the MOOC user interface is also a material-discursive element that comes with its own limitations and affordances. For instance, one of our interviewees explained how the interface impacts on the narrative construction of her course. Elements gravitating to the discursive would include instructions and guidelines made accessible to MOOC learners.

Carpentier's metaphor of a discursive-material 'knot' allows us to theorize the relationship between the material and discursive dimensions of reality in general, and the technopedagogic environment of MOOCs specifically. His work builds explicitly and implicitly on the work of feminist, post-positivist, and new materialist authors such as Haraway and Barad (see Schadler 2019), as well as on a rich tradition in material semiotics (see Law 2016).

From ANT (Actor Network Theory), Carpentier takes the insight that material objects or things are actants that can modify states of affairs, and that objects are mediators or intermediaries implicated in the social through their connection with humans. From the new materialism of Barad he takes the idea that agency – understood as the capacity to impact on the way reality is configured – can be inscribed into and generated by the interaction of objects, technologies, human and non-human actors. It is always already the result of a heterogeneous entanglement of discursive and material elements (Carpentier 2017, 43–45). Agency can be performed through individuals and other entities, but it does not originate in

them. It emerges in processes of articulation, because of what Barad calls ‘intra-action’, i.e. agency as a dynamism of forces that constantly influence each other. (Barad 2007).

Agency thus becomes ‘a matter of possibilities for reconfiguring entanglements’ that (re)configure the world. However, Carpentier does not accept the idea that we can make sense of matter – whether we talk about machines, architecture, or bodies – by separating it from the world of discourse. This can be explained with reference to the way he draws on the poststructuralist notion of articulation (Carpentier 2017, 43–45) which lies at the basis of a relational ontology where meanings can only be partially fixed as we articulate semiotic elements with each other. Poststructuralist discourse theorists like Carpentier argue that we cannot make sense of reality if we do not succeed in articulating it discursively (Carpentier 2017; Ernesto Laclau and Chantal Mouffe 1985; Marttila 2016; Zienkowski 2017).

Carpentier argues that discourse is needed to provide meaning to machines and assemblages of machines. At the same time, machines and their assemblages ‘have a materiality that invites for particular meanings to be attributed to them, and that dissuades other particular meanings from becoming attributed to them’ (Carpentier 2017, 45). Moreover, ‘these invitations, originating from the material, do not fix or determine meanings, but their material characteristics still privilege and facilitate the attribution of particular meanings through the invitation’ (Carpentier 2017, 45). This idea comes very close to the idea of ‘affordance’ understood as ‘the perceived and actual properties of the thing’ that ‘provide strong clues to the operations of things’ (Norman 1988, 9 cited in Carpentier 2017, 43).

Agency and learning design in three edX MOOCs

Educational platforms afford and restrict design options of teaching teams. Agency emerges not exclusively as the outcome of intentional learning design on the part of teaching team members but as the result of reflexive articulations of educational objectives, technological affordances, discourses, and institutional realities. EdX courses are knots of discursive and material elements that are inviting for some forms of agency while obstructing others.

We approach our interviews with the teaching team members of three SSH MOOCs as speech events wherein educators-narrators are invited “to make connections, to open certain black boxes, while omitting others, all in order to produce coherence and meaning” (Lambotte and Meunier 2013, 89–90). Interviews are no transparent windows into the ‘true’ intentions

of interviewees but should be treated as sites where interviewees retroactively make sense of their MOOCs (Gubrium and Holstein 2003, 83). They are dealt with as sites for reflection on interaction, design, and pedagogic agency. The reflexive statements of our interviewees warn us not to overestimate the capacity of edX to preconfigure agency in a unilateral way.

Our qualitative and relational analysis of the way our interviewees explain their entanglement with(in) MOOC-related activities resulted in the identification of six forms of agency (Zienkowski and Lambotte upcoming). In the current paper we will limit ourselves to a discussion of the way selected design features enable and frustrate certain forms of agency. The teaching team members were generally positive about the edX dispositive and its affordances. For instance, the professor of the SSH3 MOOC enjoys the multimodal teaching approach enabled by the platform, the increased accessibility and reproducibility of course contents, the increase in liberty for students and a reduction in teacher stress. The SSH2 professor described edX as “a very beautiful tool” that supposedly connects to the “YouTube culture” of his students and to ways of learning they have grown accustomed to.

However, the interviewees also complained about design features and options that complicate the realization of their pedagogic preferences, projects, and intentions. We will focus on three aspects of design: (1) the way edX preconfigures the narrative options for designing MOOCs; (2) forum-related options for posting and navigation; and (3) the visualization of the forums and possibilities for monitoring learner interactions. In discussing these discursive-material features of the edX platform as experienced by SSH teaching teams, we will demonstrate how they impact on the generation of pedagogic agency.

Let us start with a critical appraisal of (1) the narrative options provided by edX. The SSH1 professor deplors that the edX architecture limits the narrative options she has at her disposal for organizing her MOOCs. As she puts it, the dispositive does not allow her to open a lot of “drawers”. She explains how the platform only allows for three levels of depth: “there is the module, the sub-title if you want, and the pages. One cannot go further. So, this means that sometimes, you’re going to have either a lot, a lot of pages within an activity, or within a module, or you’re going to have a lot of sub-points. But you cannot have a lot of drawers”. The SSH3 professor clearly states that her MOOC is a simplified and shortened version of the course she teaches offline.

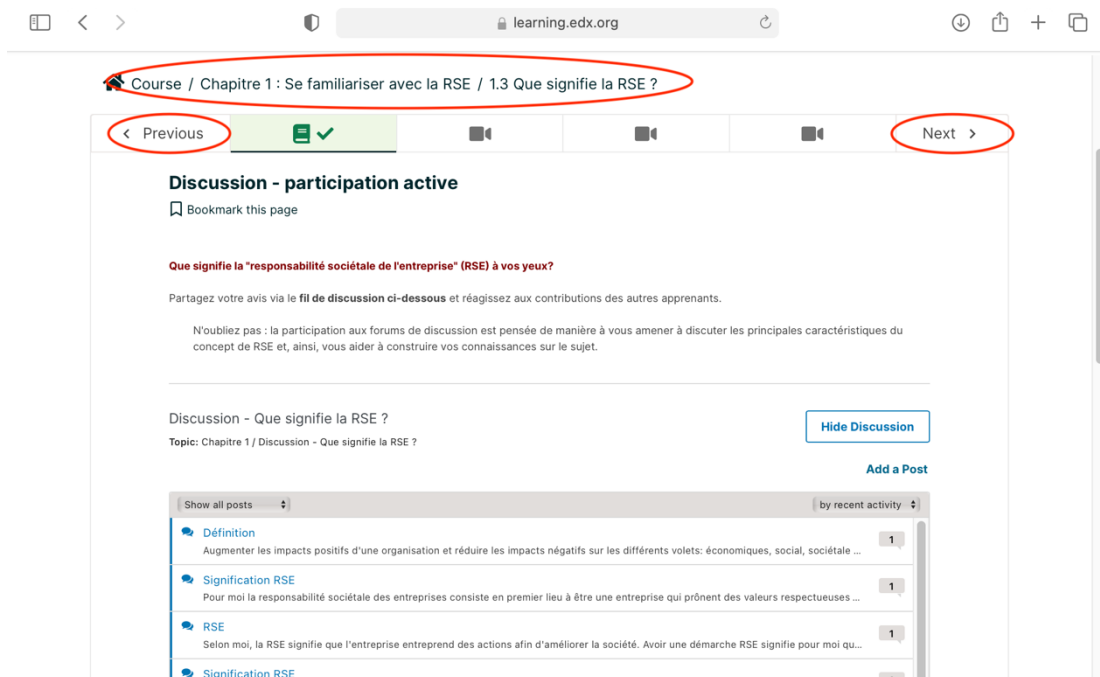


Figure 1. Screenshot illustrating three levels of depth discussed by prof. SSH1: the module is *Chapitre 1: se familiariser avec la RSE* (English: Familiarizing oneself with CSR); the sub-title is *1.3 Que signifie la RSE* (English: what does corporate social responsibility mean); pages can be navigated with the 'previous' and 'next' buttons.

The affordances and limitations of edX impact directly on the design of the SSH1 MOOC. The same issue is problematized by the SSH3 professor who pointed out that edX has a decidedly chronological and hierarchic structure. This impacts not only on course design but also on the way students can navigate through the MOOC's contents. According to her, this structure makes it quite difficult for students to quickly identify relevant information. Interestingly, the SSH3 professor by-passed, or extended, the edX dispositive by writing a printed for-sale 'accompanying manual' specifically for her MOOC, so that her students no longer need to resort to copy-pasting the video transcripts provided in the MOOC. However, it is important to point out that this manual was not only written for navigational purposes.

The SSH3 professor expressed a desire for a humanizing form of pedagogic agency whereby students do not have the impression that they are merely facing a machine. Via her book and the multimodal means offered by edX she attempts to build a "non-communitarian" social bond with her students, so that they feel connected to the course, through discursive-material

manifestations of a human being who accompanies them throughout their course. It was also a way to compensate what the SSH3 professor called a “lack of ecological adaptability”. In offline courses, the SSH3 professor can explain her course in different ways in function of audience reactions. In the MOOC she only gets one shot.

Secondly (2), the affordances and limitations of forums also impact on the pedagogic agency and design of edX MOOCs. The edX forums are the most heavily criticised features of the edX dispositive. Critical remarks of teaching team members problematize their potential for triggering in-depth discussions and reflexive interactions on the subject matter. Our interviewees problematized the fact that students do not automatically ‘follow’ the forums to which they contributed. They criticized the complex posting process and found the visualization options rather limiting. While some of the SSH teachers are experimenting with instruction design to generate more forum activity, others lowered their expectations regarding the forums or assigned other functions to them. For instance, the SSH2 professor considers the forums as places where students can share their experiences and link the subject matter of his course to their lived realities. For the SSH3 professor, the forums are another way to manifest a human presence, for instance by welcoming students to the course.

Thirdly, as edX does not provide adequate visualization options that afford teaching team members to develop a birds-eye view on the content of forum discussions, our SSH professors partially withdraw from the forums and/or delegate monitoring tasks to teaching assistants. The SSH3 professor even imagines an “ideal” or “dynamic forum” where she would be enabled to categorize the posts of her students into a mind-map that can be used for teaching purposes and for further discussion. She is nevertheless very much aware of the fact that this would require edX “to change its architecture, as well as a “crazy involvement” on her part, which might not be “manageable”.

Prof. SSH3: The ideal forum would already require edX to change its structure. Because the problem is that people constantly launch new discussion threads, so there’s no follow-up on the forum because there’s always a new thread appearing. Moreover, I think that the ideal forum would imply a crazy, but that’s why it would be ideal, an absolutely crazy involvement on the part of the professor. Because for me, the ideal forum would be a forum that I could structure. Imagine a student who asks a question, and then you have those who respond below. Being able to structure this, like “well, look, I take the answers of different people and I put all opinions A in the table over here, and all of the opinions B in the table over here”, and on this basis, I can make a comparison between opinions. This would require ... It

wouldn't merely be ... Because the problem with the forum is that it's like "there's the question and a response, a response, a response". And I think people don't have the patience to read everything. So, they will read the question, they are going to read one, two, three [answers], and then they will say "me, I'm going to give my opinion".

Interviewer: Yes, and we also saw that often, they don't respond explicitly to previous messages. So, it's often individual posts that we have observed.

Prof. SSH3: Yes, for me, the ideal forum, it's a dynamic forum. A dynamic forum in the sense of a forum where the professor can move things around and structure things, shape them, because there, right now, there is no shape. And as you say, there aren't really any discussions, these aren't real dialogues, they are individual posts.

Figure 2: Prof. SSH3 on an ideal dynamic forum

At any rate, the current architecture of the edX forums seems to obstruct the realization of a catalysing pedagogic agency. This type of agency emerges teaching team members imagine themselves and / or act performatively as catalysts for interaction, discussion, debate, and/or controversy. The current architecture of the forums also obstructs a surveillance related mode of agency whereby teaching team members imagine themselves and/or act performatively as monitors that may or may not intervene when discussions among students devolve, when forum norms are breached, and/or when erroneous knowledge circulates. While all teaching teams acknowledge that they intervene when they observe such behaviour, interventions are only possible when such situations are observed.

In this paper we have sought to demonstrate that learning design and agency are both outcomes of a complex articulation of discursive-material elements. Techno-pedagogic dispositives offer new possibilities for teaching and learning but into doing so, they may obstruct pedagogic intentions and ideals of teaching team members. At the same time, the high degree of reflexivity on the part of teaching team members with respect to the affordances and limitations of the edX dispositive demonstrate that their agency cannot be reduced to a mere effect of their inscription in to the techno-pedagogic dispositive called edX.

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