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A case study of work-based learning through the design of edX MOOCs for Latin America and the Caribbean

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Abstract

This exploratory case study analyzed the reported learning experiences among the multidisciplinary practitioners employed in the development of edX courses for a pioneering MOOC program targeted at Latin America and Caribbean. It applied work-based learning theory and activity theory to answer the question of whether and how a group of 20 participants—including subject matter experts, instructional designers, administrative assistants, platform technicians, and media producers—experienced work-based learning through their collaboration during the MOOC program's initial professionalization period. Using qualitative research methods via interviews, observation, and document analysis, it illuminated the practical, pedagogical, and organizational factors that participants identified as critical for succeeding in their jobs. The principal study finding indicated that the entirety of participants experienced work-based learning in response to systemic tensions related to one or more of the five phases of the MOOC design cycle. The secondary findings concluded that participants encountered significant pressures and opportunities for learning as a result of: developing educational resources or learning activities (80%), the need for improving organizational processes (85%), and facing constant technological upgrades (75%). Finally, the study recommends that MOOC design teams (a) rethink the role of the instructor *vis-à-vis* the techno-pedagogical affordances of the MOOC platform, and (b) design adaptive organizational structures that support a plurality of sociomaterial workflows.

Keywords: Open education, MOOCs, edX, adult education, work-based learning, Latin America and the Caribbean

Introduction: MOOCs and the Globalization of Adult Education

From an international perspective, considering that massive open online courses (MOOCs) originated in North America and the major MOOC platforms are based in the U.S. and Europe, it is crucial to investigate the professional competencies, organizational systems, and institutional policies that sustain these technologies—lest international populations are to be relegated to mere importers and consumers under the emerging globalization of online adult education. Depictions of MOOCs as US-developed, knowledge-based products have raised charges of educational hegemony and neocolonialism (Altbach, 2013; Knox, 2016), while other equally foreboding depictions equate MOOCs with increased cutbacks of public education programs and limited democratic potential, unless they were to incorporate strong interactive systems for facilitating reflective discourse practices among course registrants (Rhoads, Berdan & Toven-Lindsey, 2013).

Neither of these scenarios leaves much room, however, for individuals or organizations across the developing world to exert critical and creative discernment for adapting the generic MOOC courseware in favor of furthering their own contextually situated learning traditions and aspirations. Recognizing these individual or institutional actors' agency allows the conceptualization of hybrid pedagogies, with simultaneous local and global implications, in accordance with the evolving values of digital natives for curating, remixing, and sharing information through hyper-connected and hyper-mediated network technologies. If MOOCs are ever to deliver on their promise of advancing quality

education and international collaboration opportunities through open-access technologies, then such a recognition is a fundamental pre-condition.

EdX: An open source MOOC platform in the context of the open education movement

The open education movement provided the backdrop for MOOCs (Fini, 2009; McAuley, Stewart, Siemens & Cormier, 2010; Siemens, 2009). In addition to making educational content available the way open educational resources (OER) do, MOOCs offer interactive characteristics afforded by Web 2.0 capabilities, which are most commonly associated with "live courses" including direct instructor participation and peer-to-peer discussion. From this view, "[o]pen online courses may be considered to be a special type of OER, which solves the problem of the lack of interaction that is typical of most OER initiatives" (Fini, 2009, p. 3).

This study reflected, nonetheless, that not all MOOC platforms advance the movement for open education reciprocally. Iiyoshi and Kumar (2008) identified three main themes behind the open education movement: Open technology, open content, and open knowledge. EdX is the only major U.S. MOOC provider that satisfies all three of these conditions. This is substantiated on its offering open-access educational content via a large catalog of courses and promotion of an open knowledge ecosystem via a global developer community as well as the annual Open edX Conference (Open edX, n.d.). More importantly, edX also offers free access to its technology via an open source platform that users can adopt, contribute to, and/or reconfigure under a corresponding open license agreement. In contrast, while Coursera and Udacity also offer free access to educational content, "the legal documents on each site are worded rather strongly in the opposite direction, imposing significant restrictions on use" (Yeager, Hurley-Dasgupta & Bliss, 2013, p. 134). As such, among the three major U.S. MOOC platforms, only edX enables technological and operational knowledge transfers for adopting institutions.

When it comes to pedagogical direction, edX largely joins Coursera and Udacity in following an "extended" or xMOOC format (Yeager et al., 2013) that adopts an instructivist or "broadcast pedagogy, assuming a direct transmission of information to its largely passive audience" (Knox, 2018, p. 161). This approach stands in contrast to the connectivist pedagogical spirit of the first MOOCs that conceived the evolution of regular OER into open online courses as a shift from the traditional content-centered education model towards "socialization as information objects," where the hierarchical "one-to-many" relationship between a teacher and his or her students was replaced by the emergence of learning networks with horizontal "many-to-many" relationships among participants (Siemens, 2009, as cited in Fini, 2009, p. 3).

Concurrently, the concept of open educational practices (OEP) has emerged to signal a new direction for the open education movement that expands the study of OER and open educational content in general in favor of a more holistic agenda covering the practices and processes necessary for maximizing their impact (Ehlers, 2011; Paskevicius, 2017; Cronin, 2017, as cited in Hilton III et al., 2019). From this perspective, OEP represent

> the next phase in OER development which will see a shift from a focus on resources to a focus on open educational practices… [as] a combination of open resources use and open learning architectures to transform learning into 21st century learning environments (Ehlers, 2011, p. 12).

Furthermore, the UNESCO recently released a set of recommendations for the advancement of international collaboration on OER (*Draft Recommendation on Open Educational Resources—UNESCO Digital Library*, 2019), which outlined the following five objectives and action directives: "(i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER; (ii) Developing supportive policy; (iii) Encouraging inclusive and equitable quality OER; (iv) Nurturing the creation of sustainability models for OER; and (v) Facilitating international cooperation" (Annex – page 4).

Thus, this study inspected the technical, pedagogical, and organizational systems called to translate the innovations and evolving ideals of the open education movement into concrete benefits for a developing region—namely in the context of Latin America and the Caribbean (LAC). While most research studies and general literature on MOOCs cover a variation of measures like persistence and achievement rates, or big data analytics of student demographics and their interactions with the learning platform looking for indicators about social networks and educational models (Gasevic, Kovanović, Joksimović & Siemens, 2014; Breslow, 2016), this exploratory case study sought to address the gap in the literature regarding the socio-technical competencies and organizational structures needed for delivering MOOCs to LAC using the edX platform—as reported through the work-based learning experiences of the multidisciplinary professionals responsible for a pioneering MOOC program.

The Case Study

To preserve the study's confidentiality, both the activity setting and the study participants received fictional names. The activity setting for this case study is the Hemispheric Development Fund (HDF), a financial institution with headquarters in the U.S. and regional offices across LAC that provides economic and technical assistance for development projects to LAC countries. The HDF develops extensive research on the projects it finances and has a vast organizational structure that spans over 15 knowledge sectors. The HDF uses that literature and organizational capacity for offering training and professional development opportunities to LAC public service officials via traditional on-site and online learning courses.

In 2014, the HDF established a MOOC design program—identified in this report by the fictitious HDFx acronym—seeking to expand its robust educational offerings with the delivery of MOOCs on the edX platform. When asked about the selection of edX over alternative platforms, Matías, a founding member of the HDFx team stated that: "[EdX] was the only non-profit MOOC platform available at the time that offered an open-source version". Hence, the HDF's platform choice advanced its institutional mission to promote economic and social development in LAC through open-access knowledge. The HDFx team employs staff members as well as external consultants from multiple disciplines in its MOOC development operations—per the following 5-phase general MOOC design cycle: Needs Assessment, Instructional Design, Production, Implementation, and Evaluation. Table 1 lists the five core professional disciplines and related job functions among members of the HDFx team.

Table 1. Professional Specializations/Job Functions of Study Sample

Professional Disciplines	Job Function
Subject Matter Experts	Research, sourcing educational content, disseminating thematic knowledge via videos and other media, advising on discussion forums and student assessments
Instructional Designers	Instructional design, mapping course objectives with learning activities and educational resources, educational technology optimization
Administrative Assistants (Communication and Production Coordinators)	Transversal coordination and scheduling of operations, budgeting, hiring and liaising with external service providers, managing educational resources, liaising with edX, promoting courses on social media
Platform Technicians	Learning management system, course configuration via edX authoring tools (Studio, xModules/xBlocks), providing technical support to course registrants
Media Producers	Video production, graphic design, animation, gamification, text transcription and translation

Theoretical Framework

Work-based learning

With roots in Dewey's (1933) pragmatist formulation of learning from experience and Lewin's (1947) conception of human behavior as resulting from the interaction of the person with the environment, work-based learning is "an integral element of vocational, occupational and professional education and training,... oriented towards gainful employment and professionalism" (Blankertz, 1977; Billett, 2008, as cited in Weber, 2013). Furthermore, Marsick and Watkins (1990, as cited in Marsick, 2006) argued that "[l]earning at these different levels is all the more apparent in informal and incidental modes because learning is not subject to design and control by trainers...[but] rests primarily in the hands of the learner" (pp. 53-54).

Two levels of workplace learning are identified in the literature: (a) "Labor-related learning," resulting from formal or informal activities that are separate from production or value creation processes, referred to explicit "educational or training interventions,…such as…meetings,…training courses, counseling sessions, vocational schools, continuing education programs, virtual learning communities, etc." (Malloch et al., 2011; Sonntag & Stegmaier, 2007; Stenström & Tynjälä, 2010, as cited in Weber, 2013); and (b) "Labor-integrated learning," resulting from production or value creation processes, was described by Watkins "as a byproduct of some other activity, such as task accomplishment, interpersonal interaction, sensing the organisational culture, trial-and-error experimentation, or even formal learning" (Marsick & Watkins, 1990, as cited in Marsick & Watkins, 1999, p. 237). Watkins also noted that even though people might experience instances of incidental learning, a derivative form of work-based learning, "[they] are not always conscious of it" (Marsick & Watkins, 1990, p. 12, as cited in Marsick, 2006, p. 54), which can only make the documentation of incidental learning harder for researchers.

Cultural Historical Activity Theory (CHAT)

With roots in Marxian sociopolitical theory as reflected in the work of 1920s Russian scholars Vygotsky, Leontiev, and Luria, CHAT introduces an expansive view on the relationship between individual and environment, whereby both are reciprocally and indivisibly intertwined. Thus, by moving beyond the simplistic cause-effect explanations for human behavior set forth in behaviorism and subsequent overly individualized and psychologized conceptualizations of learning (Fenwick, 2008), "Vygotsky attempt[s] to capture the co-evolutionary process individuals encounter in their environment while learning to engage in shared activities" (Stetsenko 2005, as cited in Yamagata-Lynch, 2010, p. 15). The concept of mediated action is central to Vygotsky's explanation of consciousness development through participation in human activity:

> [T]he semiotic process that enables human consciousness development through interaction with artifacts, tools, and social others in an environment and result in individuals to find new meanings in their world (Vygotsky, 1987, as cited in Yamagata-Lynch, 2010, p. 16) ... Signs do not have concrete physical existence in the environment, but they serve as a byproduct of the interaction between individuals and artifacts/tools to mediate thought processes. (Vygotsky, 1978, as cited in Yamagata-Lynch, 2010, p. 16)

Leontiev (1981) further expanded the applicability of activity theory by proposing the concept of object-oriented activity as the unit of analysis for investigators who adopt this framework. Leontiev's object-oriented activity introduced a view on human activity as a bounded system of unified mental and physical processes derived from a participant or group of participants' mediated engagement

with material objects in consideration of their goals and motivations, sociohistorical context, and activity outcomes (Davydov, 1999; Galperin, 1992; Lazarev, 2004, as cited by Yamagata-Lynch, 2010). Additionally, Leontiev differentiated object-oriented activity from goal-directed actions, which are far more temporary and often individually focused in contrast to the former's usual greater permanence and community-wide orientation. Goal-directed actions may also be "a means for individual or groups of individuals to participate in the object-oriented activity" (Yamagata-Lynch, 2010, p. 21).

Conceptual Framework

Figure 1 presents the conceptual framework for this study. Depicted by a circumference, the heart of the conceptual map focuses our consideration of work-based learning activities from a wide gamut of possibilities into those key ones that are labor-integrated. As referenced previously, learning from labor-integrated activities at work ensues in connection to processes of production or value creation (Marsick & Watkins, 1990).

When viewed in the light of CHAT, labor-integrated learning emerges as the multidisciplinary participant population engages in object-oriented activities and supporting goal-directed actions. Thus, CHAT allows for considerations of the impact on the participants' work-based learning derived from their often temporary and individual actions (goal-directed) as well as from their generally longer-lasting and collectively informed activities (object-oriented). This framework further accounts for the materiality of work operations, highlighting the reciprocal effects of the various interactions among participants and of the tools or artifacts they employ within a contextually bounded system.
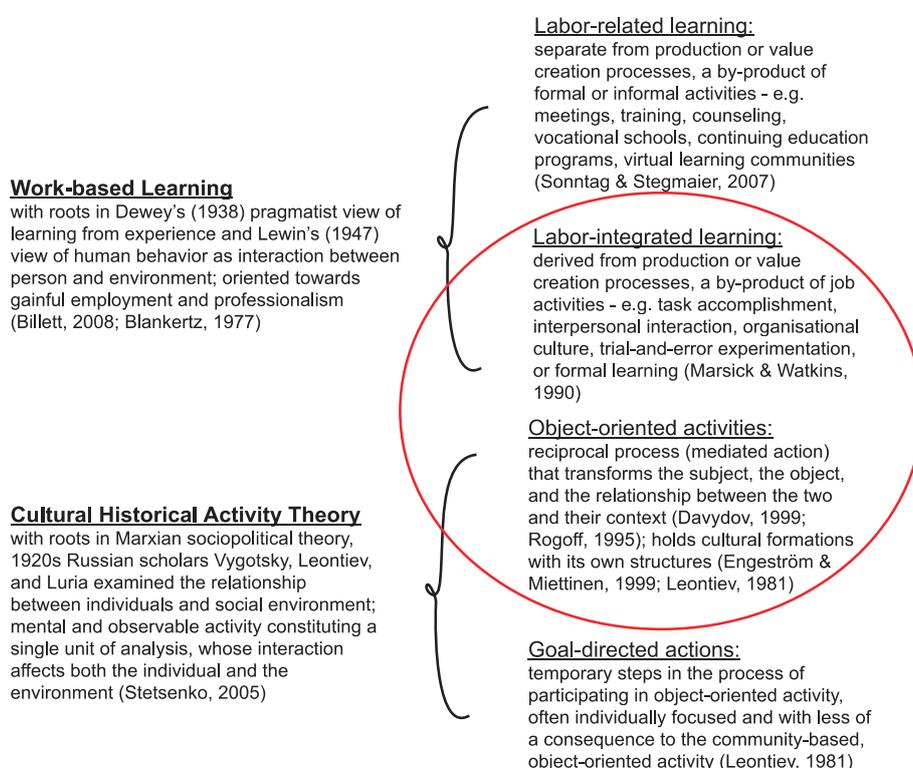

Work-based Learning
with roots in Dewey's (1938) pragmatist view of learning from experience and Lewin's (1947) view of human behavior as interaction between person and environment; oriented towards gainful employment and professionalism (Billett, 2008; Blankertz, 1977)

Cultural Historical Activity Theory
with roots in Marxian sociopolitical theory, 1920s Russian scholars Vygotsky, Leontiev, and Luria examined the relationship between individuals and social environment; mental and observable activity constituting a single unit of analysis, whose interaction affects both the individual and the environment (Stetsenko, 2005)

Labor-related learning:
separate from production or value creation processes, a by-product of formal or informal activities - e.g. meetings, training, counseling, vocational schools, continuing education programs, virtual learning communities (Sonntag & Stegmaier, 2007)

Labor-integrated learning:
derived from production or value creation processes, a by-product of job activities - e.g. task accomplishment, interpersonal interaction, organisational culture, trial-and-error experimentation, or formal learning (Marsick & Watkins, 1990)

Object-oriented activities:
reciprocal process (mediated action) that transforms the subject, the object, and the relationship between the two and their context (Davydov, 1999; Rogoff, 1995); holds cultural formations with its own structures (Engeström & Miettinen, 1999; Leontiev, 1981)

Goal-directed actions:
temporary steps in the process of participating in object-oriented activity, often individually focused and with less of a consequence to the community-based, object-oriented activity (Leontiev, 1981)

Figure 1. Conceptual framework.

Methodology

This exploratory case study employed naturalistic inquiry methods (Lincoln & Guba, 1985) to document, analyze, and report on the work-based learning experiences of a selected pool of participants in relation to the design of edX MOOCs for LAC. As such, one principal research question and three sub-questions guided this study:

1. How and to what extent, if at all, do subject matter experts, instructional designers, platform technicians, media producers, and administrative assistants report experiences of work-based learning through their engagement with the design of edX MOOCs for training and professional development in LAC?
   a. What knowledge, skills, and/or behaviors, if any, do participants believe they need to master in order to be successful in their jobs, and to what extent can those competencies be attained via work-based learning?
   b. In what ways do certain institutional, technological, and/or pedagogical conditions related to the design of edX MOOCs for LAC foster or hinder the development of those critical competencies among participants?
   c. What challenges and opportunities do participants expect having to face in response to the latest developments in MOOC technologies, and how do they expect having to adapt to respond effectively to what the future of edX MOOCs targeting LAC calls for?

Research Design and Study Sample

This exploratory case study had a recruitment target of 20 participants, divided evenly into four participants from each of the five key professional disciplines employed by the HDFx MOOC team. Using an opportunistic selection strategy, which in the context of qualitative research refers to the purposive yet flexible selection of sites or individuals (Eisenhardt, 1989; Berg & Lune, 2012; Creswell, 2014), participants were recruited in close coordination with the activity setting on the basis of their professional specialization and work activities related to the design of edX courses. Additional criteria such as age, gender, country of origin, years of professional experience, number of MOOCs completed for the HDFx program, among others, were considered only in so far as to provide a rich representation of the workplace context. Ultimately, the study sample included participants who worked on the design of different courses during the intensive professionalization period that followed the launch of the HDFx MOOC program.

   As an interpretative data collection instrument, in-depth open-ended interviews constituted the primary research method for this study. Additionally, five workgroup sessions and/or planning meetings coinciding with each of the five phases of the HDFx MOOC design cycle were selected for conducting direct and naturalistic observations. Document analysis further supplemented the data acquired via interviews and observations to paint a full picture through methodological triangulation as well as to provide material evidence for guiding the discussion with participants.

Findings

Table 2. Findings Chart

Finding	Platform Technicians				Instructional Designers				Administrative Assistants				Subject Matter Experts				Media Producers				Totals	Percentage
Participants / Professional Disciplines	Alberto	Patricio	Emilia	Marcela	Celia	Xiomara	Beatriz	Silvana	Valeria	Luisa	Daniel	Cristina	Felipe	Kevin	Karla	Simón	Víctor	Pamela	Teresa	Ricardo		
Work-based Learning via Labor-integrated Activities	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	20	100%
Developing Educational Resources or Learning Activities		×	×	×	×	×	×	×	×				×	×	×	×	×	×	×	×	16	80%
Need for Improving Organizational Processes	×	×	×	×	×	×	×	×	×	×	×	×	×	×			×		×	×	17	85%
Facing Constant Technological Upgrades		×	×	×	×	×	×	×	×	×	×		×	×			×		×	×	15	75%

Finding 1: Work-based Learning via Labor-integrated Activities

All 20 study participants (100%) reported having experienced challenges or opportunities for learning as they engaged in labor-integrated activities related to the development of edX MOOCs for LAC. This finding related directly to the principal research question, which aimed to understand whether and how participants experienced work-based learning through their engagement with the design of edX MOOCs for LAC. Specifically, the kind of learning reported by the totality of participants responded to their engagement in labor-integrated activities, or activities that were directly related to value-creation processes during one or more of the phases in the HDFx MOOC design cycle.

The uncharted origins of the HDFx MOOC program

The adoption of the edX MOOC platform by the HDF introduced a brand-new modality of instruction with major implications for the instructional, technical, and administrative talent responsible for developing the first HDFx MOOCs. As such, professionals of different disciplinary backgrounds found themselves working together all of a sudden with the responsibility of offering MOOCs to LAC for the first time in their careers. Marcela, for example, a platform technician who supports online learning solutions for the HDF, recollected how she and her colleagues took on MOOC development responsibilities: "It was up to our department, because we are the only department at the HDF that handles the topic of online training…. Moodle was the closest thing we had." Similarly, Luisa, an administrative assistant and production coordinator, remarked on her first encounter with the edX platform:

> When I joined here, I had not worked with the edX platform. I knew what a MOOC was; I had taken MOOCs and so on, but I had not created courses on the edX platform. I got to learn all the edX functionality, to explore its capabilities. Each implementation is a new learning.

All 20 participants reported work-based learning experiences in response to systemic tensions related to one or more of the five phases of the MOOC design cycle adopted by the HDF. As shown in the Findings Chart (Table 2), the analytical review of the various themes reported by the participants determined they had experienced significant learning pressures and opportunities or anticipated having to face future learning demands as a result of: developing educational resources or learning activities (80%), the need for improving organizational processes (85%), and constant upgrades in technological tools (75%). These themes in turn correspond to the remaining discoveries of this study (Findings 2-4).

Finding 2: Developing Educational Resources or Learning Activities

In response to sub-question 1a, Finding 2 indicated that 16 out of 20 participants (80%) reported having gained practical knowledge in the preparation and administration of educational resources or learning activities for MOOCs as a result of their engagement with the HDFx MOOC program. While such responses transcended all professional disciplines, they were most prevalent among instructional designers, subject matter experts, and media producers. All four participants from each of those disciplines reported such a perspective, while only two of four platform technicians and two of four administrative assistants shared the same viewpoint.

Tensions flare up among subject matter experts and instructional designers regarding the selection of educational content

Participants described the process of defining the content for HDFx MOOCs, be that in the form of educational resources or learning activities, as a contested one. On the one side, you have subject

matter experts who in many instances have devoted their entire careers to developing extensive bodies of knowledge, while on the other side you have instructional designers responsible for distilling that voluminous content into practical lessons for MOOC registrants.

Felipe, a veteran subject matter expert, described the constraints he faced when relaying his expertise in a MOOC format as compared to conventional on-site courses:

> [W]hen teaching a traditional course, you talk and talk and there might be some questions out there, but you speak for an hour or half an hour. Here, you have to summarize in ten-fifteen minutes, no more, the most important ideas. So, I got a request (from an instructional designer) for not sharing more than three important messages in a session.

On the other hand, Beatriz, an instructional designer who is critical of MOOCs that are more informational than instructional, reflected on the challenges of collaborating with subject matter experts in the selection of learning materials:

> At the beginning, you always find resistance from them (subject matter experts). Resistance of two types: the first is the resistance for trying to simplify what they know. It seems that they think it is wrong that we try to explain in simple words something that seems highly complicated... And, the second is trying to identify the central content from the complementary one. Because for them everything is important, everything is relevant for the instruction of MOOC registrants.

Adopting video-based instructional methodologies

Further reinforcing the learning-by-doing approach in the preparation of educational resources and learning activities that prevailed at the HDFx MOOC program, the adoption of instructional videos introduced significant learning pressures for many participants who had no prior experience employing this methodology. Simón, for example, identified the lack of formal training for subject matter experts like himself before shooting instructional videos:

> [It] is not something we've been doing for thirty years and everyone knows how to do. It's not like picking up the phone and making a call; it requires a series of skills that not everyone has and we would have to think on how to develop them.

For subject matter experts, therefore, the challenge of adopting video-based methodologies originated from two distinct but interlinked considerations with ultimate pedagogical implications. The first consideration responded to the mediation of instruction through digital media and online distributed technologies. The second aspect, in turn, required that the lecturer's communicational approach conform to the form and format set by said technologies and to the current viewing and learning habits of the target MOOC audience. Felipe captured this tension in a very colorful manner:

> [W]hen we started to record the course there were lots of, let's say, comments about the use of the language. They (media producers) told us (subject matter experts): 'Okay, this is very long. Make a joke!' Ah, well, we have to make a joke next time… So, there's a whole communicational aspect at play here. The gestures in front of the cameras and all that, for me at least, in the first two courses was an unprecedented experience—you have to talk more as a television anchor than as a teacher.

On the other hand, media producers reported their own experiences of work-based learning upon undertaking the production of instructional videos for the HDFx MOOC program. Ricardo, head of a video production company from Colombia, for instance, identified some of the early lessons he learned through the various MOOC projects in which his company has participated:

Many producers were making corporate videos instead of educational videos for the platform. What I mean is we were making Hollywood-style videos, loaded with lots of images, animations, etc. And, when you are taking a course, you don't need special effects and you don't need a big production either. You need a single camera, or at most a two-camera production, and a white background for showing images or key concepts on. The simpler the better because that way you will get the full attention of the person who is taking the class.

Finding 3: Need for Improving Organizational Processes

In response to sub-question 1b, Finding 3 described that a majority of participants (85%) reported the need for improving the organizational processes for the collaboration among members of the HDFx MOOC program as the most important contextual condition impacting their work. The call for improving organizational processes emerged quickly as a common theme among 17 of the 20 study participants and was shared unanimously by all participating platform technicians, instructional designers, and media producers. Additionally, three administrative assistants expressed the same position along with two subject matter experts. This widely accepted viewpoint included references about the value of managing collaboration workflows and tools as well as updating or clarifying roles and responsibilities, including considerations on the latest industry practices around big data analysis.

Identifying multidisciplinary, multinational, and multi-tool collaboration workflows

The multiple, interwoven work processes required for developing MOOCs constitute a highly complex operational dilemma—specially within the context of an organization like the HDF, given its multinational, multilingual, and multisector structure. From Cristina's perspective, as an administrative assistant responsible for the budgeting and communications strategy of the HDFx MOOC program, an important factor contributing to common operational delays resulted from the busy work schedules of the high-profile subject matter experts that the HDF employed for its MOOCs. "[O]ur experts are people who are... ex-finance ministers or finance ministers, national or international bank ministers, high-level academy professors. Then, it is not that easy to book them."

Participants also identified challenges with the adoption of disparate online collaboration tools, resulting from the lack of universal adoption or from the misuse of such tools by members of the same working group. One of the most powerful statements regarding the difficulties inhibiting the effective management of collaborative work processes at the HDF came from Silvana, an instructional designer:

[I]n an ideal world, we can anticipate; we have plenty of time available and processes follow sequentially without jumping steps. But, I think that is unrealistic; I believe that there is no job these days, in which teams and dependencies are involved in shaping processes, where everything happens linearly. We have to learn to manage with omissions, with missteps, with U-turns. In other words, learn to work in spiral, instead of working linearly.

Participant responses further described recent reorganization efforts undertaken by the HDFx program, following an internal analysis of its operative processes and dependent roles and responsibilities. Although the timeline for this study did not allow for the full documentation of the ensuing organizational changes, specifically related to the most recent addition of roles in areas like big data analysis and audiovisual technology coordination, it was expected that the almost

unanimous call for the continued improvement of organizational processes among participants reflected sufficiently the top contextual condition impacting their work.

Finding 4: Facing Constant Technological Upgrades

In response to sub-question 1c, the fourth major finding of this research study was that a majority of participants (75%) identified the constant development of technological tools as the most anticipated driver for their future learning at work. Since the emergence of MOOCs was itself a manifestation of the rapid and continuous stream of changes introduced by the latest developments in online learning technologies, it was not entirely unexpected that the multidisciplinary practitioners who work in the field would share such a perspective. Thus, three out of four participants from each of the disciplines represented in this study cited technological developments as their most anticipated factor for future work-based learning.

Similarly, as edX is the chief technological platform that powers up the HDFx MOOC program, it was only likely that it would receive constant mentions as a prospective driver for participants' future learning. As such, from the 15 total responses that substantiated this finding 12 included references to the edX platform. These references varied from expectations about periodic platform upgrades to improvement recommendations for the platform's functionality and user experience related to its perceived pedagogical and design limitations. Patricio, a platform technician, addressed these points in very practical terms:

> *[A]ll tools are constantly getting updated. Then in our line of work is either you update yourself or you die, because new things are constantly coming out. EdX is also making constant upgrades… I let the team know about the pros and cons of each new tool they are installing; that is, all the experiences that we are acquiring via test pilots I let the team know. Sometimes I have to set up one or two trainings on how a tool works, so that if they have to use it in the future they know how it works.*

Administrative assistants, on the other hand, expected future learning challenges related to their work managing discussion forums or developing learning assessment activities for MOOC registrants. In this sense, Valeria commented on the need to explore alternative evaluation tools and improve the interactivity among registrants:

> *We already took the first step of making MOOCs with multiple-choice questions as a very basic thing, but I think that at this moment we should start adding other variables that may help towards making the courses richer from one version to the other… [T]he biggest problem that usually appears in MOOCs is when you try to get away from the standard of videos, questionnaires and other such elements. You try to do activities so that there is interaction between registrants, for example, to evaluate a document among them and things like that become more complicated... I think that in MOOCs it is more complicated to have some group participation.*

In the same way, when considering the future of MOOCs, Xiomara, a team leader and instructional designer, conjured up visionary platform improvements for edX that would enable personalized learning pathways for registrants:

> *EdX could offer more personalized courses; courses that you could choose and build your own course with modules from different courses. That would also be something quite interesting, and that in the end lets you acquire the competencies that you are interested in by doing activities or whole modules in a course. Then, it could be something quite interesting when it comes to your self-training.*

Recommendation for Practice One: To rethink the Role of the Instructor *vis-à-vis* the Techno-Pedagogical Affordances of the MOOC Platform

At the heart of the MOOC-based instructional model sits the learning management system or MOOC platform. In the case of the HDFx MOOC program, the open source edX platform provides the main instructional architecture, determining the kinds of interactions and work processes necessary for developing the various MOOC components—e.g. instructional videos, readings, quizzes, discussion forums, etc. In this context, subject matter experts and instructional designers are called to provide the pedagogical know-how while platform technicians and media producers provide the necessary technical expertise, with administrative assistants acting as the connecting tissue between these two fundamental and complementary areas. Thus, teaching is no longer the exclusive purview of subject matter experts who single-handedly decide the course content, learning activities, evaluations, etc. Rather, teaching becomes a team sport, understood as a collaborative instructional design process, that involves pedagogical and technical disciplines. Such a dynamic confirms King's (1993) view on the changing role of the twenty-first century instructor, which is called to progress "[f]rom sage on the stage to guide on the side."

   In that sense, it is recommended that organizations seeking to develop MOOCs address the changing role of the instructor in the context of the techno-pedagogical affordances of their selected MOOC platform. Additionally, organizations need to provide the corresponding training and support systems for instructors to adapt their performance to the latest teaching environments. Given that MOOCs rely heavily on instructional videos as a core educational resource, subject matter experts ought to receive coaching on the fundamentals of on-camera performance— which requires a different set of communicational and presentational skills than conventional courses, as reported by participants of this study. This corroborates "the emergence of a peculiar type of actor: the '[video-recorder] teacher'—a hybrid entity comprising domain-specific content, digitisation technology and traditional academic practice," as proposed by Perrotta, Czerniewicz and Beetham (2016, p. 6). In sum, instructors become but one source, among many, for generating educational content during the MOOC design cycle. On the other hand, technical disciplines are increasingly called to complement, not simply support, the goals of instruction by aligning these with the functionality of the chosen MOOC platform. The latter, ultimately, acts as a superstructure whose user interface dictates the tools or components employed in the technology-mediated processes of instruction, along with the sociomaterial collaborations called to enact them.

Recommendation for Practice Two: To Design Adaptive Organizational Structures That Support a Plurality of Collaboration Workflows

This case study offered a particular example of the multidisciplinary collaborations that are needed to create MOOCs, emphasizing the highly specialized human resources and sociomaterial capabilities required by organizations seeking to pursue similar ventures. Furthermore, it offered a unique window into the organizational challenges that follow from the need to operationalize a plurality of interwoven yet asynchronous collaboration processes leading towards a successful outcome. Much like the HDF, multinational organizations locate their main hub of operations in one country while keeping representation offices distributed throughout the world. Such geographic dispersity increases the need for reliable online communication and collaboration tools, of which there is an abundance of options available in the exploding office-app marketplace. This, of course, is both a blessing and a curse, since too many options inevitably result in the disorderly adoption of even the most carefully designed workflows.

As a consequence, it is essential for online education leaders to realize that there is no one-size-fits-all or assembly-line type of solution that can account for the multidisciplinary, multinational, and multi-tool collaboration requirements of organizations like the HDF. Instead, leaders seeking to implement MOOC programs will be better off designing for complexity and a plurality of sociomaterial work streams rather than trying to impose rigid processes that garner little compliance among key stakeholders. Ultimately, while ensuring certain fundamentals like interactivity, scalability, and security, organizations ought to favor responsive technology systems that reflect the non-linear and heterogeneous ways of working of an increasingly diverse and geographically dispersed workforce.

Conclusion: LAC Educators Need to Challenge the xMOOC Direction Plotted by the Major Platform Providers

The listings of the major U.S. MOOC providers denote a general orientation towards content-based courses, or xMOOCs (Yeager et al., 2013), responding in large part to the basic functionality and user interface of each platform. Such an approach to MOOC design as content repositories is the result of template learning solutions that rely primarily on text-based and video-based forms of instruction. At the same time, the pursuit of alternative, more interactive educational resources or learning activities requires the allocation of substantial resources for experimentation.

These considerations were keenly illuminated in the context of this case study, as HDF subject matter experts and instructional designers clashed over how to translate vast amounts of information into practical learning activities for registrants. Furthermore, if course developers wanted to steer away from the basic template functionality of the edX platform—e.g. introducing peer-reviewed assessments or theme-based discussion boards—, the time commitment and professional resources necessary for achieving such implementations *vis-à-vis* the massive nature of these courses would render them unsustainable in the long run.

Amid those limitations, educators from LAC and other developing regions will do well to question the direction plotted by the main platform providers for the maturation of MOOC technologies. For an educational innovation that once promised unbridled potential, the content-based xMOOCs that boast about massive enrollments, Ivy League sponsorships, and celebrity instructors represent nothing more than the concept of "banking" education that Freire (2000) vehemently opposed as vehicles of oppression.

For that reason, unless LAC academic institutions are to become the digital dumping grounds for the excessive instructional output of commercial MOOC catalogs, they ought to reorient their MOOC programs towards the connectivist principles of the original network-based MOOCs, or cMOOCs. In that way, LAC MOOC creators might actually position regional academic institutions as nodes of learning on the open web while joining in the development of distributed and socially-constructed forms of knowledge in conversation with other institutions that experiment with connectivist MOOCs around the world. For LAC, this distinction can be the difference between becoming an effective knowledge node among global research networks or a simple data mine for the major U.S. MOOC platform providers.

This report sums up the findings, recommendations, and conclusions derived from an exploratory case study conducted in the particular context of the HDF, a fictitiously named organization which in 2014 established a pioneering program for delivering MOOCs to LAC via the edX platform. The study illuminated the many ways in which the professionals that were called to develop the first MOOCs and thus to disrupt the otherwise lethargic world of higher education experienced their own share of work-based learning demands. The group of multidisciplinary practitioners responsible

for MOOC design operations at the HDF—including subject matter experts, instructional designers, administrative assistants, platform technicians, and media producers—learned how to prepare educational resources and learning activities for MOOCs, called for improvements in organizational processes, and anticipated having to adapt to future technological upgrades in the heat of their collaborative labor-integrated activities.

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