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Learning designers and educators in the 'third space': the socio-technical construction of MOOCs in UK higher education

by

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ABSTRACT

FACULTY OF ENGINEERING AND PHYSICAL SCIENCE

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LEARNING DESIGNERS AND EDUCATORS IN THE THIRD SPACE: THE SOCIO-TECHNICAL CONSTRUCTION OF MOOCS IN UK HIGHER EDUCATION

Steven White

Massive Open Online Courses (MOOCs) have been portrayed as "agents of change" in Higher Education (HE) which impact on educator practices, course design and teaching. However, MOOCs do not 'fit' neatly into existing university organisational structures, or align completely with conventional university functions. Few studies have looked at the complexity of the relationship between social change and the construction of MOOCs within higher education, particularly in terms of educator and learning designer (LD) roles and practices. To address this gap, this study combines the analytic strategy of Socio-Technical Interaction Networks (STIN) with the social theory of a 'third space' in HE. Thus it analyses socio-technical activity which spans professional and academic domains of HE in order to account for both educator and LD roles. The approach balances concerns with social and technical factors in analysing the relationship between technologies and social and organisational change related to MOOC development.

The research involves a multi-site case study of three UK HE institutions. It aims to capture an empirically based, nuanced understanding of the extent to which MOOCs are socio-technically constructed in particular contexts, and the social implications of developing MOOCs, especially for educator and LD roles and practices. The findings highlight the complexity of interactions and collaborative processes underlying MOOC development. LDs are shown to occupy a hub-like position within a network of social actors, incentives, pressures and technologies involved in MOOC development and implementation. This LD role is enacted within an emergent 'third space' which spans conventional academic and professional boundaries and functions, allowing LDs and seemingly peripheral actors to significantly shape and partially unbundle the roles of educators in determining course structure and content.

The study contributes a valuable socio-technical element to research on the third space which frequently identifies TEL projects as characteristic of third space activity, yet fails to consider the role of technology in co-constructing this space. The findings also provide a richer understanding of the LD role and the way social and technical means can be deployed to shape this role and the roles of others within a third space context. The thesis has implications for the planning and implementation of online learning projects and other domains of inter-professional practice in which Web technology and education coincide.

Table of Contents

List of Tables

List of Figures

DECLARATION OF AUTHORSHIP

I, Steven White

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

Learning designers in the 'third space': the socio-technical construction of MOOCs in UK higher education

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:

Preliminary findings from the first of the three case studies used were published in:

White, S. and White, S., 2016. Learning Designers in the 'Third Space': The Socio-Technical Construction of MOOCs and Their Relationship to Educator and Learning Designer Roles in HE. *Journal of Interactive Media in Education*, 2016(1), p.17. DOI: http://doi.org/10.5334/jime.429

Signed: .....

Date: .....

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Abbreviations

ANT – Actor-Network Theory

AT – Activity Theory

cMOOC – connectivist MOOC

HE – Higher education

HEFCE – Higher Education Funding Council for England

HEI – Higher education institution

ICT – Information and communication technology

IPP – Inter-professional practice

LD – Learning designer

MOOC – Massive Open Online Course

OER – open educational resources

QCA – qualitative content analysis

RQ – Research question

SCOT – Social Construction of Technology

SI – Social Informatics

SME – Subject matter expert

STIN – Socio-technical interaction networks

TA – thematic analysis

TEL – technology enhanced learning

UA – University A

UB – University B

UC – University C

xMOOC – instructivist MOOC

Chapter 1: Introduction

Massive Open Online Courses (MOOCs) have been widely discussed and debated as potential "change agents" in HE (Liyanagunawardena, Adams, and Ann Williams, 2013; O'Connor, 2014). There has been speculation about their possible impact on education in terms of:

- changing teaching and business models
- increased openness and access
- concern about threats to the nature of academia itself (Boven, 2013)

Although mainstream media discourse has exaggerated the possible impact of MOOCs (Bulfin et al., 2014), more finessed critical analyses nevertheless recognize that these types of courses have created a renewed focus on the place of online learning in higher education (Laurillard, 2016).

This thesis focuses on one area of possible consequent change in HE, exploring the relationship between MOOCs and the roles of those who develop and implement them in the context of UK higher education. This chapter gives an overview of the research problem, the aim and scope of the study, and the main research questions. The final section gives a preview of the overall thesis structure

1.1 Research Problem

Much mainstream and academic commentary on MOOCs has included predictions about their impact on higher education. A range of forces has driven their growth, including increasing demand for higher education, commercialisation, massification, and evolving views of knowledge and the role of technology in learning (Conole, 2013). Linked to all of these drivers, the features of openness and scalability distinguish MOOCs from conventional online learning initiatives (Glance, Forsey and Riley, 2013). This raises the issue of how well MOOCs 'fit' into universities, and how they relate to the roles and practices of those tasked with creating them.

Research into (non-MOOC) online learning has shown the potential for tension and conflict between educators and learning designers in course development, and the consequent importance of teamwork in these processes (Cowie and Nichols, 2010). Furthermore, the open and massive features of MOOCs fail to align fully with the existing structures or conventional functions of research, teaching and service which characterize common understandings of the

mission of universities (Daniel, 2014). For this reason, some researchers have linked MOOCs with possible changes in the nature of university courses and the roles of academics who create them (Daniel, 2012; Fischer, 2014; Sharrock, 2017). This is mainly commentary, however, and reviews of the literature identify a lack of empirical studies into the roles of those who produce MOOCs (Veletsianos and Shepherdson, 2016), and a lack of clear policy statements from universities on their aims in producing these courses (Marshall, 2014).

In the absence of specific work on MOOCs in this area, wider educational research into changing identities and roles in HE have identified increasing activity within a 'third space' which is located between academic and professional departments of universities (Whitchurch, 2013). This third space emerges as universities grapple with a range of internal and external pressures and drivers, creating a need for individuals who can work across or outside of conventional organizational boundaries in universities. Significantly, studies of third space activity foreground technology-enhanced learning (TEL) initiatives as exemplars of such processes. In these studies, the roles of learning technologists or learning designers (LDs) are seen as "increasingly essential to the delivery of higher education" (Courtney 2013, p.46) but such studies have yet to consider MOOCs. Further, these studies maintain a purely social focus on changing boundaries between and unbundling of HE roles previously assumed to be fairly well defined (Whitchurch, 2013). Such research ignores the mutually shaping relationships which link Web technologies and their social contexts (Halford, Pope and Carr, 2010).

This thesis then, attempts to explore the consequences of introducing MOOCs into the established context of UK higher education institutions for the roles of educators, learning designers and the courses they produce. In the case of MOOC development, complex tensions exist between the mission of the university, the configuration of the technologies involved, and the broader contextual drivers of such activity at institutional and societal levels.

1.2 Aim and scope

The research underpinning this thesis is grounded in the inter-disciplinary field of Web Science, which aims to balance social and technical concerns, creating a socio-technical perspective on the co-construction of Web artefacts and their contexts of use. The study itself explores the extent to which MOOCs are socio-technically constructed in particular HE contexts. It investigates the implications of introducing MOOCs into these contexts, especially for educator and learning designer roles and practices.

The project is based on case studies of three UK higher education institutions collaborating with the same commercial MOOC platform provider. Each institution has a different approach to

MOOC development and implementation. Empirical, qualitative methods are used, drawing on semi-structured interviews with a cross section of social actors and analysis of relevant documentary data. The research uses the social theoretical lens of third space activity in higher education to guide data collection and interpretation. This is combined with the analytic strategy of Socio-Technical Interaction Networks (STIN) to help balance concerns with social and technical factors in the analysis.

Comparative analysis of results from the three institutions in the multiple case study is undertaken in order to highlight similarities and differences in the socio-technical configurations which emerge when the technologies and commercial agreements associated with the platform provider are embedded within the particular institutional context of each university. The aim of this analysis is to explore the (possibly unexpected) consequences of introducing these open and scalable courses for the roles and practices of educators and learning designers in HE. Thus, the study intends to inform understandings of online course development and implementation in the future. As such the analysis will explore the different socio-technical 'local configurations' of MOOCs hinted at in recent research (Bali, 2014; Bayne and Ross, 2014; Conole, 2013) which are likely to shape both the forms of MOOCs and their implications for local practices in different HEIs.

However, the research recognizes the time-bound nature of the study in the contrasting context of a fast-changing field. The particular findings are inevitably just a 'snapshot' of MOOC development at a particular time, taken in the knowledge that approaches to course development and the nature of courses produced will change both in the future and even during the course of the research itself. As a consequence, the main value of the study is in bringing the social theoretical lenses of third space and STIN to bear on a particular example of TEL use in HE, with the aim of highlighting the insights these lenses can afford to researchers, and to practitioners involved with making strategic and practical decisions on TEL projects.

1.3 Research questions

The main research question is as follows:

How are MOOCs and educator and learning designer roles and practices socio-technically constructed in higher education?

Three sub-questions shape my main research question:

1. What are the socio-technical systems related to MOOC development in which learning designers and educators are involved?

2. What are the roles of educators and learning designers within MOOC development projects?

3. How do educators perceive the influence of MOOC development on their wider practices, and what documentary evidence is there to support this perception?

Research question one draws on the Socio-Technical Interaction Networks (STIN) analytic strategy (and the set of heuristics outlined in chapter 3) to help illustrate the socio-technical arrangements that emerge in each MOOC development context. The question examines the network of people, resources, equipment, documents, legal arrangements and communication channels which shape the configuration and use of particular technologies (Kling et al., 2003). This helps highlight the interaction of social and technical forces of co-construction at play as a technology shapes and is shaped by the social context within which it comes to be embedded.

Research question two brings the social theoretical framework of third space activity in HE to bear on the STIN findings. This adds a depth of understanding to the social context of MOOC development, examining the extent to which those involved with TEL (technology enhanced learning) projects act in a third space outside of conventional academic or professional boundaries in HE. Participant perceptions of their own roles and those of others are explored and compared, using relevant concepts from third space theory and the understanding of MOOC development activity provided by the STIN analysis. The combination of STIN analysis and third space theory helps to foreground the range of internal and external social or organizational pressures at play, whilst also recognizing how these forces can be enacted via choices relating to technology configuration and use.

Research question three focuses particularly on educators in asking whether and how they perceive involvement with MOOC development to have influenced their wider (non-MOOC) practices. Here, the research draws on Boyer's four-part categorisation of scholarly activity as discovery, integration, application and teaching to understand how MOOCs relate to the wider academic practices of educators. Once again, results of the STIN analysis provide a way to balance social and technical considerations in this respect, whilst also examining the extent to which documentary evidence supports educator perceptions of changes in their practices.

1.4 Contribution of the research

This thesis contributes to knowledge in the fields of online learning and higher education research by:

- Identifying the 'LD as hub' role in MOOC development in HE, thus filling a gap in the research on the roles of those involved in MOOC development. Empirical evidence is presented of the consequences of introducing MOOCs into HE settings, explaining the significance of LDs within a complex socio-technical network of MOOC production, and the substantial unbundling of educator roles in this network

- Providing novel empirical evidence of the extent to which LD roles in MOOCs are located in an emergent third space in HE as part of "inter-professional teams" (Macfarlane, 2011) in which "the development of academically oriented project work appears to both co-exist with and extend mainstream academic activity" (Whitchurch and Gordon, 2010).

- Adding an important socio-technical dimension to understandings of third space activity in HE (Whitchurch, 2008, 2009, 2013), which often highlights TEL projects as typical sites of third space activity, yet fails to give consideration of the role of technology in shaping the roles of those working on these projects.

- Informing professionals and leaders in HE institutions about how those involved in MOOC projects can work together, highlighting and clarifying the function of LDs in HE and "embedding and integrating these roles more firmly into daily academic work practices" (Courtney, 2013, p.46).

- Extending the scope of previous work into the roles of those who create MOOCs by considering a range of actors and data sources at multiple institutions, within the bounded context of a single platform provider

1.5 Thesis structure

The introduction chapter has outlined the research problem, aim, scope and research questions guiding the study. The intended contribution of the research is also highlighted.

Chapter two reviews the literature in order to define MOOCs, and briefly highlight the educational and technological context in which they developed. The chapter outlines how MOOCs have been linked with potential changes in teaching and learning in HE, and how much research in this area relies on potentially problematic technologically determinist narratives. Consequently an

opportunity to take a socio-technical perspective on scholarship is identified, which can address the gap in the literature in this area. In the absence of substantial research relating specifically to educator and LD roles in MOOCs, the literature on these roles in conventional online learning is critically reviewed. A link is then made between these roles, MOOCs and the concepts of the third space activity in HE, and within it the unbundling of educator roles within course development teams.

Chapter three focuses on the theoretical framework on which the research is based. The first section highlights the need for an interdisciplinary, Web Science approach which balances social and technical considerations in researching MOOCs. It details how the research draws on the established field of Social Informatics as a way to understand how ICTs become embedded in social and organizational contexts. Within Social Informatics, the STIN analytic strategy is identified as a way to generate data whilst balancing these social and technical concerns. The chapter explores the aim, nature and methods of the STIN strategy, considering its strengths and weaknesses for this study, whilst also acknowledging potential alternative perspectives. Finally, the alignment of STIN within the broader research design is highlighted.

Chapter four outlines the multiple case study methodology used in the research. The chapter states the assumptions underlying the qualitative, interpretivist epistemology on which the study is based and how this aligns with the type of knowledge required to address the research problem. It then explains how the multiple case study approach was applied and outlines the selection of sites, selection of samples, and data generation methods. Triangulation of interview, observation and documentary data is discussed as a way to address concerns of the authenticity and credibility of data generated, as is the ethical basis on which the study was conducted.

Chapter five reports on findings of the STIN analysis, comparing and contrasting results for each of the case study locations. Each of the STIN heuristics is dealt with in turn, creating an emergent depiction of the socio-technical interaction networks embedded in each location. The analysis highlights significant choice points in MOOC production relating to strategic decisions, course development processes and course content and structure. It also highlights how learning designers become more central 'hubs' in the network of MOOC production whilst conventional educator roles are challenged via social and technological decisions and to some extent distributed to seemingly more peripheral actors in course design. The chapter ends by providing a simplified summary of the STINs at each location, focusing on significant points of similarity or difference between activity at each site.

Chapter six presents findings on the extent to which STIN analysis can contribute to understandings of MOOC development as a third space activity in higher education. This section

explores the way in which the hub-like role of LDs uncovered in the STIN analysis operates through third space processes of contestation, reconciliation and reconstruction. It demonstrates how, as a result of these processes, LDs come to reflect Whitchurch's depiction of Blended Professionals, negotiating and shaping their own roles and those of others across conventional organizational boundaries of professional and academic departments. The chapter also highlights how technological choices identified in the STIN analysis are intertwined with the social processes which are the focus of Whitchurch's work. Third space processes are used as a lens help to show how roles of those involved in MOOC production evolve over time at each university. Although distinct choices and arrangements of organizational and technological structures are made, the LD as third space hub role emerges as a common factor across sites as projects mature.

Chapter seven describes the findings on the extent to which academics perceive involvement in MOOC development to influence their wider practices in their work in HE institutions. It uses Boyer's categorization of scholarship (as discovery, integration, application and teaching) as a way to understand scholarly activity and relates this to the ways educators interact with and respond to MOOCs in their work.

Chapter eight discusses the findings in more depth, highlighting key claims and reflecting on the ways in which they 'speak to' the relevant literatures. The first section identifies how the key institutional priorities for MOOC development and platform design interact to shape courses and social practices at the institutions. The second section identifies a learning designer as 'hub' role and its significance in a socio-technical network of MOOC development, whilst the third section examines this hub role in light of the concept of third space and LD interactions within in it as 'blended professionals'. A socio-technical 'gap' in third space theory is identified and used to highlight a more extensive MOOC learning designer role than current conceptions of 'brokering' or 'bridging' functions. The next section addresses the concept of unbundling of educator roles in MOOC development, comparing this to wider understandings of unbundling in HE. The sixth section discusses any changes in wider educator practices that are linked to MOOC development activity. The final section discusses the implications of the study in relation to the emerging idea of inter-professional practice (IPP).

Chapter nine concludes the thesis, summarizing the research questions, findings, limitations and contribution of the study. Implications of the work and areas of future research are proposed to which the study might contribute.

Chapter 2: Literature review

This literature review gives an overview of the place of MOOCs within HE, the forces driving MOOC development, and predictions regarding the influence of MOOCs on the roles of educators and other stakeholders in HE. The review highlights a gap in the literature on educator and learning designer roles in MOOC development and implementation, and argues that empirical research is required to understand the processes underpinning the construction of MOOCs, and the consequences of their introduction.

Dominant technologically determinist perspectives in TEL research are critiqued, and a more inter-disciplinary, socio-technical approach to studying MOOCs is proposed which recognises the interaction of the social and the technical. The review draws together research from the fields of TEL and HE studies to identify concepts of unbundled roles and 'Third Space' activity as particularly important for understanding the roles and practices of those involved in the production of MOOCs. It is argued that understanding the influences on these roles and practices is only possible by examining the social contexts in which projects are embedded and the technologies with which they intertwined.

2.1 Defining key terms: MOOCs, educators and learning designers

This section defines key terms used in the thesis to establish a clear understanding of how the terms MOOCs, educators, learning designers, roles and practices are understood and used throughout the project.

2.1.1 Defining Massive Open Online Courses (MOOCs)

There are various pedagogical and technical designs of MOOCs (Daniel, 2012), and ambiguity can exist with regard to each of the elements of the MOOC acronym (Anderson, 2013; Hood and Littlejohn, 2016). These issues will be discussed to some extent in the upcoming literature review. Nevertheless, the degree of "common agreement and understanding" of the main terms 'massive open online course' seems sufficient for the term to remain useful (Saadatdoost and Sim, 2015). In a concise definition which is sufficient for the purposes of this study, Littlejohn describes "a course aiming at large-scale interactive participation and open access via the Internet" (Littlejohn, 2013). Though these open, interactive online courses can take many forms, this thesis focuses mainly on the xMOOC-type courses identified in section 2.5.

2.1.2 Defining educators, learning designers (LDs) and learning design

Although various stakeholders can be linked to MOOC development activities, the positions of educator and learning designers are central to this research and are defined and elaborated for the purposes of this study below.

Academics in UK HE have a range of functions organized around the "tripartite" roles of research, teaching and service (Macfarlane, 2011). This study focuses mainly on academics involved in MOOC development and so distinguish them with the label 'Educators'. Educators are typically lecturers (with teaching and/or research roles) at the institutions in each case study, who primarily operate in MOOC projects as Subject Matter Experts (SME) as described in Caplan and Graham's categorization of online course development roles (2008, p.187). This role can be distinguished from previous conceptions of academics in online learning projects as "Lone Rangers" - those drawing on their own pedagogical and technological knowledge in relative independence from colleagues (Chao et al., 2010). The primary activities of these SMEs is to check alignment of learning objectives and content, provide content itself, and suggest learning activities for inclusion (Caplan and Graham, 2008).

In contrast, learning designers (also known as 'instructional designers') are understood to perform "the systematic and reflective process of translating principles of learning and instruction into plans for instruction materials, activities, information resources and evaluation" (Smith and Ragan 1999, p.2). The primary activities of instructional designers (amongst other more context dependent tasks) include creating, sequencing, and adapting content and learning outcomes in relation to an ADDIE process of analysis, design, development, implementation, and evaluation. Kenny et al. (2005) argue that the extent and complexity of such design roles is increasing and that the ADDIE template for action, and somewhat linear models of instructional design are rarely followed closely in practice. The nature of the LD role can be linked to the emergence and influence of social constructivist learning theory in tandem with increasingly open, Web-based learning environments. This change in focus has engendered (among some, but by no means all professionals in the field) a reduced emphasis on the 'instruction' aspect of their work and the creation of the title of 'learning designer' to account for their "diversifying and expanding role" (Seeto and Herrington 2006, p.741). This change of title aligns with a more nuanced, less linear conception of "learning design". Seeto and Herrington (2006, p.742) draw together research from a number of sources to define learning design as a practice which includes provision of pedagogical advice, project management, academic writing and more broadly "determining the pedagogies, resources and delivery strategies of a learning environment".

As both social constructivism and Web-based learning environments are particularly relevant to the focus of this thesis, the terms 'learning designer' (LD) and 'learning design' have been chosen to represent individuals in these roles and their practices.

2.1.3 Defining roles and practices

In answering the research questions on the activities of educators and learning designers in MOOC development, it is important to distinguish between those activities directly related to the construction and implementation of MOOCs, and the wider activities of educators in their HE work. For this reason, the terms 'roles' and 'practices' have been identified to serve these respective purposes. The concepts of practices and roles are not the focus of the research in terms of developing understandings of the concepts themselves, rather clear definitions of them are required to better understand the activity of educators and learning designers.

2.1.3.1 Defining practices

This thesis applies the concept of practices to the wider (not directly MOOC-related) work of educators in the case studies, following Weller's work on emerging norms and methods in digital scholarship (Weller, 2011). In order to study the socio-technical construction of MOOCs and the implications of this process for educators, a way to conceptualise the scholarly activities of academics in HE is required. Practice theory is not a neatly coherent field, but Cetina et al. (2005) note that most approaches broadly view practice itself as "arrays of activity" or "routinized behaviour" (Reckwitz 2002, p.249). Practices are seen as a way to understand both structure and agency in human behaviour, including the emergent structures of technology which are shaped through interaction with humans in situated contexts (Feldman and Orlikowski, 2011). This understanding informs Orlikowski's 'practice lens' approach (2000) and aligns well with the Social Informatics research on which this thesis draws, having been used in recent STIN studies (Meyer, 2007; Villar-Onrubia, 2014). This social practice approach has also been used in studies of HE to understand the relationships of humans, artefacts and the ways in which interactions between them influence social reality (Trowler, 2012).

2.1.3.2 Defining roles and unbundling of roles

Within this definition of broader practices, in this thesis a role is broadly understood as the functional activity related to MOOC production or implementation. The concept of a role is related to but differentiated from identity by Castells, who explains that "[i]n simple terms, identities organize the meaning while roles organize the functions" (Castells 1997, p.7). This interpretation recognizes that identities and roles can be a fluid, "cumulative project"

(Whitchurch, 2008b) rather than one of essentialist, fixed properties, so the term is useful for looking at contexts in which change may be occurring. This positions individual roles (and agency) in negotiation with social structures and the roles of others. In relation to HE in particular, Macfarlane (2011, p.62) distinguishes more functional roles (which can become narrowed or 'unbundled' as they are determined by system-wide forces) with (academic) identity as an overall concern for generation and communication of knowledge, and the disciplinary conventions for doing so. This thesis uses a definition of unbundling which focuses on social roles and the way academic work can be divided into specialist functions (Kinser, 2002), and the "specification of activities within each function" (Paulson, 2002, p.125). This understanding is distinct from wider concepts of "increasingly disaggregated curricula and services, the affordances of digital technologies, [and] the growing marketization of the higher education sector itself" as explored in in research such as The Unbundled University project (unbundleduni.com, 2018). The current study aims to add to understandings of how such roles may evolve during MOOC projects and across spaces in organisations as interactions are co-constructed by both social and technical factors.

These definitions permit nuanced, socio-technical understandings of practices (as routine arrays of activity in academic work) and within that of roles (as negotiated, functional, MOOC-related activities). Thus roles and practices interact with the organizational and technological structures with which they are intertwined.

2.1.3.3 Mutual shaping and influence

The overall aim of this study (and of the field of Social Informatics on which it draws) is to understand the complex, mutually shaping relationship between humans and technology (Kling et al. 2005). As will be discussed, the thesis approaches with caution any deterministic accounts which position technologies as simplistic causes of social effects or impacts (Oliver 2011, p.382). The research therefore both problematizes and investigates the idea of 'influence' (of technology on humans, or vice versa), and includes (in RQ3) an exploration of participant perceptions of their relationship to MOOCs. As a result, the term influence is not strictly defined in this study as it draws on ideas and methods from the field of Social Informatics to understand the complex and multi-layered participant relationships with the technologies with which they interact. Indeed, Meyer elaborates on this position in explaining how SI researchers "are interested in the hyphen connecting the social to the technical" (Meyer 2014, p.57), neatly capturing the nuanced focus on the problematic term influence in socio-technical studies of technology.

2.2 MOOCs as drivers of change in higher education

MOOCs have initiated substantial debate in both public and academic discourse (Bozkurt et al. 2016), with much discussion of the drivers underpinning MOOC development. They have been described variously as forces of disruption, dynamics for access and openness in education (Boven 2013), or as marketing and branding tools (Davis et al., 2014). In terms of teaching and learning, reviews of the literature also identify MOOCs as potential "change agents" in HE (Liyanagunawardena et al., 2013). However, it is important to note that the massive and open properties of MOOCs mean that such courses do not align completely with conventional university functions of teaching, research and service (Daniel, 2014). According to Weller (2015), these massive and open elements provide commercial imperatives for platform providers to become involved in MOOC development, though such organizations frequently ignore lessons learned from past research into online and distance learning. In drawing on wider narratives of Web-based disruption (in music or book publishing, for example), portrayals of MOOCs in mainstream media have often presented MOOCs as irresistible forces of nature or scientific progress, masking the commercial motivations of platform providers (Bulfin et al., 2014).

Increasingly, however, academic discourse is dealing with more practical concerns of the place of MOOCs within HE (Kovanović et al., 2015). Research has highlighted MOOCs as part of HE strategy in various geographical areas (Jansen and Schuwer, 2015; Allen and Seaman, 2015) and coverage has been linked to a revitalized interest in digital technologies amongst academics (Laurillard 2016, p.6). The aims of universities in producing MOOCs have been linked with a concern with openness, access and flexibility (Ossiannilsson, 2014), with pragmatic strategies for institutional growth (Davis et al., 2014; Brown 2018), or with attempts to improve both online and face-to-face teaching provision in universities (Yuan et al., 2014). The range of motivations attributed to those who produce MOOCs perhaps helps contextualise Siemens' comment that MOOCs represent the efforts of contemporary universities to understand and redefine their role in the age of the Internet (Siemens, 2013). Causes of this struggle to accommodate MOOCs into HE lie in their potential for scalability and openness, something that distinguishes them from conventional online or distance learning courses (Glance et al., 2013). This links to Daniel's comment above that MOOCs don't 'fit' neatly into the core functions of universities. The idea of a lack of fit is important in this study, and has implications for the roles and practices of those involved with MOOCs, and the forms of courses which are produced.

The following section builds on this exploration of the relationship between MOOCs and change in HE by discussing the educational and technological roots of these courses.

2.3 The context of MOOC development

2.3.1 Online learning in UK higher education

It is important to consider the development of MOOCs within their social, political and historical context in order to understand their current position in UK HE. Online learning has grown out of the extensive tradition of distance learning stretching back over 100 years in the UK, and is thus a "historical product, which has been influenced by multiple educational, social, and political factors over time" (Lee, 2017, p.16). Over the past twenty years, online learning has seen substantial growth in HE (Lee, 2017). Indeed, a 2010 HEFCE report (White et al., 2010) finds over 500 distinct online distance courses available through HE institutions (175 of which were partnerships with commercial providers). However, these changes should not be viewed as the simple result of the technological affordances of online technologies. Indeed, Selwyn (2017) argues that over the past forty years higher education has been a part of broader societal shifts in response to forces of globalization, neoliberalism and growth of the knowledge economy. Factors such as commercialization and introduction of quasi-market forces into HE have influenced a "reorientation, reconstitution and redefinition" of the sector (2017, p.15).

Such shifts are evidenced in both public and private sector interests relevant to HE. The UK government, for example, established an 'Online Learning Task Force' (2011, p.23) under the specific terms of reference to explore "pedagogical and commercial opportunities" of online education in HE. Indeed, Peacock et al. (2009, p.116) trace initial drivers of moves to include technology in education (and the creation of the role of learning technologist) to the Dearing Report (NCIHE, 1997). Likewise, private sector providers have expressed strong interest in the promising commercial potential of the HE market (Watson, 2015) and online learning in particular (Weller, 2015). HE providers have also pursued new business models, referring to potential "clients" and "customers" rather than students (Lee, 2017, p.18) in what are partially commercially driven, often international initiatives. In this context, collaboration between HE and industry is encouraged by governments and the private sector as part of moves toward preparing students for demands of a rapidly developing 'knowledge economy'. Significantly for this study, collaborations of this kind often require more convergence of professional and academic roles in HE (Whitchurch and Gordon, 2010).

Increasing commercial interest in HE has been accompanied by particular ways of framing the needs or problems associated with the education sector. Indeed, Weller identifies the 'Silicon Valley Narrative' as a perspective on education which is based on assumptions that "education is broken" and only innovative, revolutionary technological solutions, delivered by the private sector

can provide answers (Weller, 2015). Such narratives predominate in media reporting of technology and education (Bulfin et al., 2014) at a time where funding levels for research into distance learning (Black, 2013) and online learning in HE are falling (Lee, 2017). Lee highlights the risk in such contexts where the potential affordances of technologies (widening participation, increasing access) are highlighted without the basis in empirical research and observed practice to support them (2017).

These social, economic and political changes helped create fertile conditions for the growth of some forms of MOOCs and extensive coverage of them in the popular media.

2.3.2 From OER to xMOOCs and beyond: the context of MOOC development

More recent roots of MOOCs can be traced through developments in distance education and online learning (Siemens, 2013), and the development of the Open Educational Resources (OER) movement (Liyanagunawardena, Adams, and Williams, 2013) as shown below.

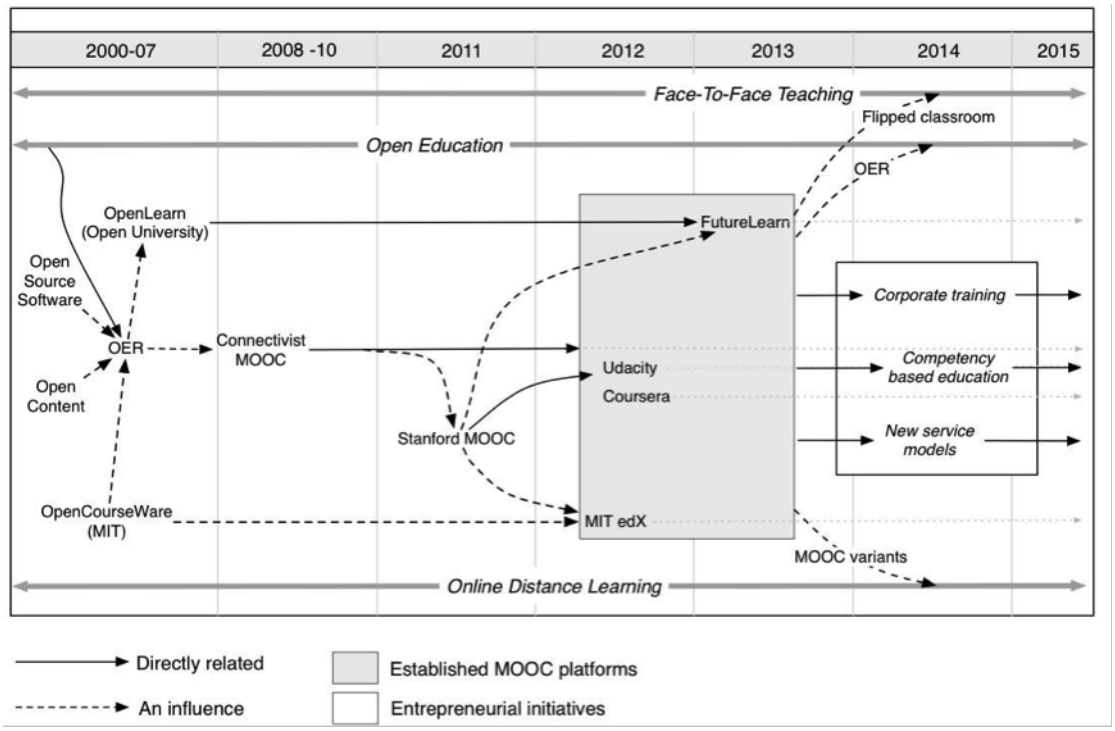

Figure 1: A timeline of the development of OER and MOOCs (Yuan, 2015)

Although the first MOOC launched in 2008 as an experiment in connectivist learning, widespread media coverage accompanied the launch of more conventionally designed instructivist xMOOC courses from 2011 (Yuan and Powell, 2013). Figure 1 depicts this development process from OER in the early 2000s to the various forms of MOOCs available in 2015. The growth of MOOCs globally was rapid (see Table 1, below) the number of courses launched rising from approximately 250 (in 2012) to a total of 9400 in 2017 (Shah, 2018), though the latter represents a cumulative

figure including MOOCs launched on major platforms since 2012, not all MOOCs currently running.

Year	Number of MOOCs	Universities producing MOOCs	Number of participants
2012	250	40	2m
2013	1200	200+	10m
2014	2400	400+	17m
2015	4200	500+	35m
2016	6850	700+	58m
2017	9400	800+	78m

Table 1: Number of MOOCs and participants year on year 2012-2017 (Shah 2018)

Though uptake of MOOCs was faster in the US, between 2012 and 2015 the UK had 30 MOOC providers, hosting 182 courses via 5 different platforms (Macintyre, 2016). Following Weller's aforementioned Silicon Valley Narrative, this growth in MOOCs was widely portrayed as evidence of disruptive technologies in HE by commentators who argued that "because they were large-scale and free, they could educate the world". However, these claims were widely questioned by researchers at the time, and later shown to be exaggerated (Laurillard, 2016, p.5).

Although the OER movement which preceded MOOCs is often perceived somewhat uncritically as inherently socially beneficial (see Rhoads et al., 2013; Knox, 2014), MOOCs have received trenchant criticism in both distance education (Baggaley 2014) and open education fields (Wiley, 2015). Criticism largely focuses on the commercial motivations of MOOC providers, the simplistic pedagogical models employed, and the potentially low quality educational experiences which some MOOCs yield. Such debate perhaps reflects how the changing social, political and economic context of higher education has influenced the creation and evolution of MOOCs. Drivers of change relating to MOOCs include increasing demand for higher education, competition between providers, growing engagement with online education, evolving views of knowledge and the need for information and digital literacy (Conole, 2013).

Intertwined with these drivers of MOOCs in HE are the perceived affordances of the online technologies which underpin them. Laurillard (2016) highlights the ability of MOOCs to operate at scale (producing substantial amounts of learner data), whilst allowing a large learner cohort to move through a course together, or at least "engage together" in some way (Gillani and Eynon, 2014). In his work on connectivist thinking, Siemens takes a socio-technical view which foregrounds ease of access to information, the importance of networks and networked

knowledge, and the resulting changes to roles of teachers and learners in education as significant aspects of MOOCs for education (Siemens, 2008; Siemens, 2012). Such a perspective calls for recognition of the changes in the context of learning, and approaches to education which take full advantage of the opportunities for interaction, participation and communication which the Web affords (Anderson, 2008). It should be noted, however, that Kop's study of connectivist MOOCs (those initially championed by Siemens) calls for more learner support in Web-based learning environments of a cMOOC variety, which can be somewhat chaotic (Kop, 2011). This, along with the commercial and competitive pressures noted above, perhaps partially explains the willingness of many universities to collaborate with external platform provider entities who provide a more conventionally structured learning environment than early connectivist MOOCs (Ebben and Murphy, 2014). Indeed, Shah (2015) shows that by the end of 2015 (the outset of this research study) the number of MOOC platforms stood at 40 globally, in collaboration with over 500 HEIs, representing continued growth since 2012.

2.4 Evolving and diversifying MOOC pedagogies

In order to understand how educators and learning designers both influence and are influenced by MOOCs, it is important to examine the development of MOOC pedagogies. This helps reveal assumptions and principles upon which MOOC designs have been based, and the issues with which those involved in MOOC development projects likely have to grapple. As mentioned previously, pedagogies can contrast starkly, and so have been used as a basis to distinguish between them.

The connectivist (cMOOC) and instructivist (xMOOC) categories represent a relatively simple way to distinguish between MOOCs (Ebben and Murphy, 2014). This categorization positions cMOOCs as leveraging social connectedness based on many-to-many relations, whilst xMOOCs use instructor-lead one-to-many relations (Rodriguez, 2012). xMOOCs are typically seen as relying on more traditional instructivist 'transfer of knowledge' pedagogies (using videos, quizzes and limited participant interaction). However this cMOOC – xMOOC distinction over-simplifies the types and characteristics of the range of available MOOCs (Conole, 2013; Hood and Littlejohn, 2016; Brouns et al., 2017). Indeed, an in-depth study of UK MOOC pedagogy by Bayne and Ross (2014) found that contextual factors including disciplinary influences, institutional teaching culture, and learner data collection techniques are relevant to the MOOC designs which emerge.

Other studies have taken a more evaluative approach, and may provide insights into the roles of those involved in MOOC production. In the UK context, MOOC platform providers such as Coursera, edX, Canvas and FutureLearn have worked with UK universities to produce courses

which Margaryan et al. (2015) categorize as xMOOCs. It is claimed that social constructivist principles and established ideas of conversational learning have been used to inform the pedagogy underlying the FutureLearn MOOC platform, creating a so-called 'sMOOC' or social MOOC design (Ferguson and Sharples, 2014). Nevertheless, various kinds of MOOC offerings (including one FutureLearn course) have been criticized in an empirical study for their low quality instructional design (Margaryan et al., 2015). This provides some support for criticisms made by established distance learning experts that MOOC designers failed to take account of existing scholarship in distance education and online learning design (Baggaley, 2014).

The literature seems unclear, however, on how educator and learning designer roles inform these decisions about MOOC learning design. Margaryan et al. concede that they can only "speculate" about the "potential causes" of (pedagogically) poor "centralized and standardized designs" in xMOOCs, highlighting the prioritization of "institutional marketing considerations" over "pedagogic concerns" as one such possible cause among many others (2015, p.82). Laurillard more boldly asserts that the pedagogical deficiencies in xMOOC designs stem from stipulations on platform capabilities which have been dictated by technologists, rather than by the needs of educators (Laurillard, 2016), but offers no supporting evidence for this claim. Analysis of these studies suggests a need for further research in order to understand the relationship between the MOOCs produced and the roles and practices of those who create them.

The literature on MOOC pedagogies suggests some useful avenues of research for this thesis, but is limited in extent and depth. The next section widens the scope of the review by considering related but distinct studies into the place of MOOCs in the wider context of teaching and learning in universities.

2.5 The relationship between MOOCs and teaching and learning at universities

Having looked briefly at the context of MOOC development and the underlying pedagogical design of these courses, it is useful to consider how MOOCs relate to teaching and learning more widely in HEIs. The following section reviews MOOC-related research on the roles of teachers and learners, the embedding of MOOCs in HE institutions, and criticisms of the educational underpinnings and consequences of implementing MOOCs.

2.5.1 MOOCs as challenge to teacher and learner roles

The literature on MOOC development suggests that educators may face challenges in incorporating MOOCs into their existing roles and practices. Many institutions made the decision to develop MOOCs relatively rapidly, in the absence of substantial research on the likely consequences of such decisions. This "ready, fire, aim" approach (Marshall, 2013) was undertaken in the context of wider technological and social changes and pressures, including increasing use of the Web across society (Weller, 2011). The Web offered continually increasing information storage and search capacity, and facilitated interaction and communication which was relatively unrestricted by geographical and temporal boundaries. This created awareness of the need for new information and digital literacy skills among teachers and learners in education (Conole, 2013; Stewart, 2013; Weller, 2011).

MOOCs have been described as a reflection of this transitory stage in higher education, in which these courses "offer a middle ground for teaching and learning between the highly organised and structured classroom environment and the chaotic open web of fragmented information" (Siemens, 2013, p. 6). This transition is likely to pose challenges for educators accustomed to constructing more conventional, bounded courses. As such, MOOCs represent a way for educators to experiment with the affordances of the Web for large scale social learning (Bates, 2014; Dron and Anderson, 2014). For these reasons, MOOCs have been seen as a way to engage with new conceptions of the roles of teachers and learners in education in which learners can take a far more active participatory role (Stewart, 2013).

2.5.2 MOOCs as catalyst to innovation in other courses

In addition to consideration of the wider learning context, MOOC researchers predicted more direct effects on teaching and learning within HE institutions. In his widely cited and quite critical commentary on the growing MOOC phenomenon, Daniel identified improvements to university teaching as one probable consequence of MOOC development (Daniel, 2012). A later report by Yuan et al. (2014) also claimed the use of concepts from MOOCs might be used to enhance face-to-face and online teaching. Other commentators also advocated analysis of MOOCs as a means to understand and develop the affordances of face-to-face or blended learning programmes (Eisenberg and Fischer, 2014) and to create distinctive educational offerings and unique learner experiences (Stewart, 2013). It should be noted, however, that such views represent commentary rather than empirical research on such uses of MOOCs in HE.

Limited research exists on the "embedding" of MOOCs into existing for-credit courses, where challenges were found to exist in terms of timing of courses and aligning content (Bruff et al.,

2013). Other studies are again restricted to commentary on the potential for the "unbundling and rebundling" of courses (Anderson, 2013), and combining aspects of "community and content-based models" of MOOCs in existing courses (Yuan et al., 2014). Although this mixing of pedagogies is presented as a new opportunity, Anderson and Dron have long contended that technologies and pedagogies (or more specifically seeing pedagogies as technologies) are "additive", with new techniques being built upon existing ones (Anderson and Dron, 2012). Nevertheless, the evidence for the value of blended courses over purely face-to-face or solely online offerings is mounting (de Freitas et al., 2015), and it is argued that exposure to MOOCs may stimulate educators to reflect on opportunities for blended learning in their wider practice (Fischer, 2014). This view is supported by Laurillard (2016) despite her misgivings about the limited impact of MOOCs in widening access to education.

2.5.3 (Un)learning lessons from online and distance learning research

In contrast to discussion of the educational benefits of MOOCs, Baggaley (2014) takes a more critical stance, particularly with regard to the effects of MOOCs on perceptions of distance and online education. It is claimed that some advocates of MOOCs have dismissed or distorted the body of knowledge generated by researchers in distance and online education (Weller, 2015), to the extent that a "disciplinary hijack" is occurring (Baggaley, 2014, p. 137). Attempts to closely align campus educational offers with MOOCs are also criticised as ill-judged because, it is claimed, they better represent opportunities for "non-formal learning", rather than a chance to repackage efforts at "transmitting information at scale" (Bates, 2014). Wider concerns are also raised about the potentially restrictive neo-liberal characteristics and consequences of MOOCs in limiting academic integrity and freedom in developing nations (Altbach, 2014). Liyanagunawardena et al. (2013b) also outline potential problems of access, language and computer literacy facing HE faculty and potential MOOC participants in the context of developing countries. This range of criticisms of MOOCs reveals an underlying concern with a lack of fit between MOOCs and the HE context, though without substantial empirical evidence in support.

In summary, though a number of studies above make a persuasive case for the *potential* of MOOCs to change educator roles and the courses they teach, studies which empirically investigate this potential are lacking. The following section explores this gap in the research further.

2.6 A gap in the research

2.6.1 Research on MOOC and educator / learning designer roles and wider practices

The previous section outlines a number of studies which mainly comment on the potential for MOOCs to influence the roles of teachers and forms of teaching and learning in HE. However, systematic literature reviews have highlighted a lack of empirical (especially qualitative) research into the influence of MOOCs on educators (Veletsianos and Shepherdson, 2016) and "those who create" MOOCs (Liyanagunawardena et al., 2013a).

A few such studies do exist, though they focus on educators rather than directly including the LDs who work closely with them. Researchers at the University of Toronto highlight the opportunities for collaboration between faculty and learning designers afforded by MOOC projects, as well as helping educators to reflect on the structure and clarity of face-to-face and blended courses they offer (Najafi et al., 2015). The study uses a relatively small sample (8 participants) from a single institution, however. Bayne and Ross (2014) have investigated socio-technical factors influencing MOOC pedagogy in UK HE, but educator and LD roles remain outside the scope of that study. Blackmon (2018) adds to the data on educator experiences in teaching on MOOCs, but again lacks any consideration of their course development roles, or relation to LDs and uses a limited sample of educators (n=8).

Since this research project began in 2016, some studies have begun to recognize the complexity of producing MOOCs and the consequences of doing so for the roles of educators and LDs. The early phases of this research project identified the centrality of the learning designer role in MOOC production, working at the centre of a "massive team effort" within which educators have less influential roles than in conventional teaching (White and White, 2016a). At the same time, Zheng et al. (2016) argued for the need for a "holistic view" of MOOC production because of the complexity of collaboration required. They contend that "teaching a MOOC is more like resourcing and implementing a large project" than creating a face-to-face module in HE. León-Urritia et al. (2018) confirm the importance of the "project team" in MOOC production, which they characterize as a "highly demanding task", involving "reputational risk" for the institution and educators involved, and requiring a range of "human and technical resources". As will be argued in section 2.13, these concepts resonate with third space understandings of introducing new projects in HE.

In a study which uses activity theory to take a socio-technical perspective on the MOOC element of openness in relation to educator roles and practices, Czerniewicz et al. (2016) identify tensions between openness and copyright concerns in relation to a single MOOC. This brings out an

important socio-technical element of MOOC development processes in terms of highlighting social and legal consequences of leveraging technologies for openness and massiveness in educational contexts, which this thesis hopes to explore further. Studies by Literat (2015) and Cheverie (2013) also address legal and copyright issues implicated in MOOC development, but rely on reviews and commentary instead of empirical work.

The studies by White and White, Zheng et al., León Urrutia et al., and Czerniewicz et al. indicate the substantial challenges involved in MOOC production for educators and LDs. They also clearly signal the need for a better understanding of the social and technical consequences of MOOC development processes, and of the roles and practices of those involved.

Two studies do consider implications for educators of teaching on MOOCs for their wider (non-MOOC) practices, but focus only on their perceptions of influences on teaching. Blackmon's findings on this issue are confined to speculation on future teaching activity, and a rather generalized statement that "teaching a MOOC caused several participants to rethink ways of teaching in their face-to-face courses" (2018, p.85). A further, more extensive study (drawing on 186 questionnaires and 15 semi-structured interviews) includes some attention to the "impact on instructional practice" of MOOCs (Lowenthal et al. 2018). The study finds that MOOC instructors perceive the experience makes them think about "making things more explicit … more carefully intelligible, being more imagistic and image-driven" (2018, p.12). However, these studies are confined to instructor perceptions of the implications of working on MOOCs for their wider teaching work, and no evidence is presented of substantive changes in practice.

2.6.2 Adopting a socio-technical approach

Studies from the broader TEL field add weight to calls for a socio-technical approach from those of Czerniewicz and Bayne and Ross above. Arguing with reference to research in the Humanities, Fry claims "[t]here is a need to develop a grounded understanding of how scholars are actually using ICTs in their work" Fry (2004, p.304). Others also argue this is more generally the case in relation to a relative lack of studies of the interaction of scholarship and technology in education (Veletsianos and Kimmons, 2012; Gregory and Lodge, 2015). This lack of focus on the role of technology in the educational literature, according to Brown (2016), oversimplifies particular technologies as mere tools, rather than recognising the possibility of socio-technical shaping processes.

With specific reference to MOOCs, Yuan, Powell and Olivier (2015) recognize that both technological and pedagogical factors are crucial in shaping processes and outcomes of course design, and identify academic and learning designer roles as an important site of renegotiation in

MOOC development (2015, p.12). Further, the Universities UK MOOC report (2013, p.28) highlights the need to better understand "how the development and application of online approaches require changes in the processes and procedures that underpin that mission". This is especially true in the light of the lack of perceived close 'fit' between MOOCs and the traditional mission of universities (Daniel, 2014). It seems therefore, that a gap in the research exists in terms of the relationship between academic practices and roles, and the socio-technical construction of MOOCs in HE. This provides an opportunity to apply a Web Science perspective, which views the Web "not as an independent thing", but a "socio-technical phenomenon, brought together […] by people, historical contexts, antecedents, (sub-) cultural norms, and expectations" (Carr et al., 2010). In the context of MOOCs, it becomes possible to interrogate the co-constitutive relations (Halford et al., 2010) between educators, learning designers and the Web technologies underpinning MOOCs.

Although this focus on technology as more than a tool is important in gaining a fuller understanding of the subject, it is conversely important not to simplistically position technology as a cause of particular social effects, as the following section will argue.

2.7 Technological determinism

2.7.1 MOOCs and technological determinism

To demonstrate the need for socio-technical research into MOOC development and use, it is important to understand the weaknesses in technologically determinist accounts of technology use in education. Substantial efforts have been made to introduce computer technologies into universities in terms of investment and policy initiatives, but the results remain "inconsistent and highly variable" across courses and institutions (Selwyn 2007). Support for Selwyn's claims exists (see section 3.3.4) in the substantial body of research into ICT use in organisations in the field of Social Informatics (Sanfillippo and Fichman, 2013). This includes empirical studies into ICT in education specifically (Dutton et al., 2004; Walker and Creanor, 2009) and more theoretical discussions (Haythornthwaite, 2006).

Nevertheless, reporting of MOOCs in mainstream and academic media often highlights the potential of MOOCs to create substantive, disruptive and even revolutionary change in higher education (Bulfin, Pangrazio, Selwyn, 2014). Such narratives often evoke themes of science ("experiments", "innovation", "invention") or nature ("tsunami", "avalanche", "online wave"), as identified in discourse analysis of MOOC reporting by Bulfin et al. (2014). It is claimed that presenting educational technology in this way is driven by technologically determinist thinking, a

term credited to social scientist Thorstein Veblen. This technologically determinist perspective views technology as possessing inherent properties, leading to inevitable impacts on users and thus changing their social world (Selwyn, 2010). Rather than helping explain how uses of technology are learnt, Oliver argues, this concept "serves to hide how designers communicate their intentions and preferences to users" (2011, p. 374).

2.7.2 Aligning methods and claims

A further problem with technologically determinist thinking is that it often conflicts with the underlying educational or epistemological philosophies used in educational research. Oliver (2011) argues that social constructivist thinking, common in many studies, does not align well with deterministic, causal claims which often result from educational studies. This is because social constructivist researchers, having constructed their own accounts of the technologies, "cannot claim unproblematic, direct access to the 'true nature' of technology" (2011, p. 382). Oliver argues for more focus on social practices which include technology use, rather than observations of these social practices, from which conclusions are made only about the effects of technologies. In this sense, technologies should not be abstracted from their context, allowing the "messy realities" of technology use to be addressed (Selwyn, 2010). It is argued that "there is a lack of evidence for the causal effects of technology", and that people rather need to come to understand them, incorporate them into social practices, thus shaping or even rejecting them in the process (Oliver, 2013).

2.7.3 Focusing on realities of technology use

This critique of the technologically determinist thinking underlying much TEL research entails a different focus for research studies. Selwyn (2007) calls for research which investigates the reality of current technology use. This involves a focus on a 'pessimistic perspective' (Selwyn, 2011) which looks at technology as it is rather than as it could or should be (Selwyn, 2010), and gives due attention to the organisational and social context of technology development and use (Haythornthwaite, 2006). The organisational context of technology development is relevant, as decision-making and broader policy is often based on "technology driven" perspectives (King and Boyatt, 2015). An example of this perspective can be found in Stoddart's (2015, p.595) statement that "large and measurable change" can be achieved through "investments in educational technology", a claim that Selwyn's findings would call into question. Eichhorn and Matkin (2016, p.28) also make broad predictions about the potential of "MOOCs to transform education", but base claims about the impacts of MOOCs solely on unspecified "press and policy statements" as

evidence (p.31). In such contexts, critical research can also reveal the "often uneven, contested and contradictory realities of technology use within educational settings" (Selwyn, 2010, p. 67).

Ultimately, this approach might counter-balance the rhetoric of 'tsunami' or 'avalanche'-like change which characterised early media responses to MOOCs and perhaps allow relief from a cycle of "hype, hope and disappointment" (Gouseti, 2010) in working with technology and education.

The weaknesses of technologically determinist perspectives and the gap in the research on the creators of MOOCs demonstrate, therefore, the need for a socio-technical approach that investigates technology in its social context, but as more than a simple tool to be employed.

2.8 Considering the interaction of scholarship, disciplines and technology

2.8.1 From academic tribes to wider contextual influences

Having considered ways of understanding technology and change, it is useful to consider the relationship between disciplinary norms, academic practices and technology. In a study of educator experiences of teaching on MOOCs, Najafi et al. (2015) recognise that creating and running MOOCs requires substantial input from subject specialists within their disciplines Focusing more on MOOC pedagogy, Bayne and Ross (2014) find that the pedagogy of particular MOOCs can be "tightly aligned" with disciplinary norms. The idea that differences in epistemological beliefs, practices and norms shape academic disciplines was first proposed by Becher (1989) who created a metaphor of academic 'Tribes and Territories'. Becher uses the metaphor to explain differences between disciplinary groupings in academia, and the norms which influence their ways of thinking and acting.

More contemporary work has questioned the applicability and 'course grain' of the tribes and territories metaphor, instead using practices as the unit of analysis in HE. Indeed, Trowler et al argue that the significance of disciplinary influences may be declining, creating the possibility for a shift in the nature and role of universities (Trowler et al., 2012). Both Trowler et al. (2012) and Selwyn (2017) identify external factors (massification of HE, commercial pressures to compete in international contexts, perceptions of students as consumers) as increasingly significant influences on academic practices, in addition to disciplinary culture. For example, Weller (2011, p.10) finds that technologies which are "fast, cheap, and out-of-control" are likely to be those that influence modern digital scholarship within particular disciplines. He explains that such technologies require little investment of time or money to produce, and can be freely distributed

and shared on the Web. However, this seems likely to contrast starkly with the MOOCs produced by many universities (mainly after his book was published). Indeed, many MOOCs require substantial time, resources and planning (Hollands and Thirthali, 2014), for example around 600 hours effort in Belanger and Thornton's (2013) report on a Coursera MOOC produced in the US. MOOC production also often entails a cross-institutional, team-based production process (Alario-Hoyos et al., 2014) though this is not necessarily the case with regard to the earlier cMOOCs to which Weller also refers. Concern with external influences of massification, internationalization and commercial pressures are common themes amongst both proponents and critics of MOOCs, so approaches which can account for these are useful tools in this research.

2.8.2 Socio-technical aspects of MOOC development

In addition to Becher and Trowler's focus on broader academic norms and practices in HE, research in the field of learning technology is also useful in highlighting a range of factors shaping MOOC development. Bayne and Ross foreground the "socio-material mix" of platform architecture, learner behaviour, educator beliefs and preferences in addition to disciplinary or institutional culture as factors which shape MOOC design and implementation (Bayne and Ross, 2014, p. 58). Unfortunately, the activity of learning designers in this socio-material mix is not considered in depth in their study, but the foregrounding of platform architecture alongside social factors provides an example of a socio-technical approach which this research seeks to apply. Similarly, Oliver highlights the interaction of social and technical (or material) factors which shape the practices of educators (2012), and the pedagogies they adopt (Anderson and Dron, 2011). Even social theorists like Trowler et al. recognise the interaction of technologies and contemporary academics as significant. They make claims which align with a socio-technical perspective in recognising the co-construction of technologies and academic practices in HE, describing:

"The interaction of humans operating in practice clusters, and the tools they use, leading to changes in practices, which in turn shape tool use" (Trowler et al. 2012, p. 242).

Research in online learning which recognizes and theorizes the influence of external and internal socio-technical pressures is developing, and this thesis aims to build on such work, capitalizing on the opportunity to better understand the relationships between MOOCs, educators and LDs in HE.

2.9 Collaboration and complexity in online learning design

2.9.1 Understanding roles and practices in online learning

Understanding changing roles and practices among stakeholders in online learning is challenging because of the complexity of influences discussed in section 2.9 above. Indeed, Salmon (2005) explores a range of institutional and personal factors which can affect change in technology use, which are "beyond the provision of technology" alone, thus rejecting technologically determinist accounts of such change. A range of studies have looked at factors influencing adoption of online learning (Dutton et al., 2004; Laurillard, 2004; Maguire, 2005) and improving rates of staff satisfaction or engagement (Shea et al., 2005; Power and Morven-Gould, 2011). Studies on the diffusion of innovations (Rogers, 2010) and the Technology Acceptance Model (Davis, 1989) have also been applied in the field of online learning, but are also more focused on technology uptake and usage respectively. However, this research is focused on the *roles* of those engaged with MOOC development, and the way these courses and the actors' wider *practices* are shaped.

2.9.2 Educator roles and practices in online course development

More relevant to the present study is work by Kirkwood (2009) and Kirkwood and Price (2014) which argues that educator conceptions of teaching and learning strongly influence their roles and practices in technology use. This idea can be linked to research on teacher identity and MOOCs by (Ross et al., 2014), who find that MOOC educators in HE fulfil a complex role, and that the educational practices they enact "have histories which are not erased by the shift from classrooms to digital environments". Indeed, McNaughton and Billot's (2016) study of teacher identity during times of contextual change in HE finds that both internal and external pressures form a part of these histories, especially where technological initiatives create ambiguity around shifting academic roles. Resistance to change can in some circumstances be linked to "poorly defined role distinction". This ambiguity or blurring of roles in relation to educational technology is a key focus of this study. It is vital to note that educators are not the sole determiners of MOOC development, which is recognized as a team-based process with learning designers playing a key role by Najafi et al. (2015). However, Najafi et al's study lacks direct consideration of the learning designer perspective and uses a relatively small sample of educators (n=8) as the only participants interviewed. As a result, and as discussed in section 2.7, empirical research into these team roles and processes is limited.

In the absence of further extensive research into educator and learning designer roles specifically in MOOCs, the literature on course development in blended and online learning may provide some basis on which to proceed.

2.9.3 Collaboration and teamwork

The process of developing online courses is different from face-to-face course development in significant ways. Gregory and Lodge (2015) outline how academic staff (sometimes as individual educators) take responsibility for conventional course development in a process which can be "solitary" and without significant consultation with others (Chao et al., 2010). In contrast, studies of online course development show that for educators, "autonomy yields to collaboration" (Oblinger and Hawkins 2006, p.15) with a variety of stakeholders, amongst which the "role of the learning designer is crucial" to achieve quality in courses produced (Seeto and Herrington, 2006, p.741).

In their practical description of online course development, Caplan and Graham propose that the range of development roles required are centralized in a single 'departmental unit' (Caplan and Graham 2004, p.256), whilst also collaborating with educators from relevant disciplines. They outline a number of LD duties, including advising educators (who are seen as Subject Matter Experts, or SMEs in this process) on the sequencing of learning outcomes and activities, and providing a "project management" role (2008, p259). SME roles are also outlined in terms of ensuring "the content of the online course is an appropriate alternative to the lecture content normally given in a traditional course" (2008, p.187). To do this, SMEs are also expected to "write exercises, activities, and examinations", with guidance available from LDs as noted above.

However, it is important to note that these duties are conducted as part of a complex, "concerted effort from many players" (2008, p.256), and that the nature of the work is "constantly shifting" (Davis et al., 2008, p.124). Indeed, Davis et al note that design approaches and roles of course developers can change significantly in relation to the size, scope and potential scalability of online learning projects - an important point with which producers of MOOCs have to grapple. In these fluid circumstances, it is important to recognize that interactions between those involved in course development may not necessarily be governed by clearly defined roles and centralized organizational structures as outlined by Caplan and Graham.

Indeed, in his research into the UK context, Oliver (2002) highlights the subtleties of collaboration as a key aspect of the related role of learning technologists. His interviews with learning technologists (conducted before the term learning designer gained currency in the UK) reveal their view of the various forms of "open" and "hidden negotiation" that are required in their job

to subtly influence technological initiatives. The importance and distinctiveness of the LD role is further highlighted by Keppell (2007) who draws on ideas from communities of practice theory in describing their "brokering" role between educator communities of practice in blended learning projects (though he bases this claim on a relatively limited single case study evidence base). Such work suggests that there are important aspects of the role which are not adequately described in more functional lists of LD duties (as found in Caplan and Graham, for example).

2.9.4 Learning designers as negotiators

Research in the context of UK online learning provides interesting insights into the 'hidden' roles and skills which are necessary for LDs in HE (though at the time the catch-all term used was learning technologist). A scoping study of TEL roles in UK HE by Beetham et al. identified "multi-skilled and peripatetic" learning technologists who occupied a "pivotal role" in online learning initiatives (2001, p.4). Drawing on the various aspects of learning technologist roles identified in this 2001 study, Oliver (2002) analysed the data generated in a relatively limited sample of six interviews, identifying diverse roles involving collaboration with academics and relationship-building across functions within their HE institution. Interestingly, Oliver's findings are predictive of Whitchurch's later work on third space professionals (see section 2.13 on Para-academics and the third space). Though their work does not intersect, both Oliver and later Whitchurch (2013) cite the 1997 Dearing Report (NCIHE 1997) and Gornall's (1999) subsequent idea of "new professionals" to inform their understanding of learning technologist roles which are "hybrid, marginal, yet central to institutional processes and change" (Oliver, 2002, p.246). Although Oliver's study is some fifteen years old and pre-dates the inception of MOOCs by at least six years, it provides important insights into developing understandings of the LD role.

Indeed, there is evidence to suggest that the collaborative nature of the LD role requires considerable subtleties that may lie outside of formal structures or role descriptions. Oliver's analysis of semi-structured interviews with learning technologists highlight the various forms of "open" and "hidden negotiation" that they believe are required in their job. They often rely on "goodwill, expertise and rhetoric to create opportunities (both practical and educational) and influence policy" (2002, p.248). The identification of these hidden, negotiation activities suggests that there are important aspects of the role which are not adequately described in more functional lists of LD duties, such as that found in Caplan and Graham, for example.

The suggestion that LDs need to cross "borders" between professional and disciplinary communities has interesting parallels with work on "third space" in HE (Whitchurch, 2012), which will be discussed further in section 2.13. Courtney summarizes early research into online learning

in the third space, focusing on the work of learning technologists in HE and identifying signs of "blurring of boundaries between the roles of learning technologists and academics" (2013). Salmon and Wright also recognize the ambiguities and tensions between professional and academic staff in online learning initiatives and call for more "constructive collaboration" at the organizational level (Salmon and Wright 2014, p.916).

Using a similar single institution case study to Keppell, Cowie and Nichols (2010) argue that LDs need an ability to "bridge distinctive cultures" in course development, acting with an awareness of the potential for conflict and tension at points where roles and responsibilities intersect or overlap. Power relations are renegotiated between educators and LDs in their case study, resulting in a need to focus on relationship building and maintenance as a priority. This highlights the usefulness of considering the socio-cultural context of online course development (Campbell et al., 2009), where the values and principles of those involved can shape approaches to course development or implementation - as is the case with MOOCs (Bayne and Ross, 2014; Ross et al., 2014).

2.10 Taking a socio-technical perspective on online learning

However, just as technologically determinist points of view (where technologies simplistically cause social change) are to be avoided, socially determinist perspectives which fail to adequately account for technological influences are also limiting (see section 2.8). Keppell (2007) and Campbell et al. (2009) rightly recognized the importance of relationships in shaping online learning projects, and Oblinger and Hawkins (2006) recommend that LD and educator roles should be rethought, with selection of technologies as a final step. It is important, though, to consider the technologies involved as more than tools (Brown, 2016). Seeto and Herrington (2006, p.742) take a step in this direction in considering learning designer roles in light of "the affordances of web-based delivery", although a Web Science approach is cautious of simplistic affordance-based perspectives.

A Web Science approach, as will be discussed further in section 3.1, draws on interdisciplinary thinking in order to consider the interplay of social and technical factors and the contingency of Web properties, for example by looking at how openness (e.g. in Web-based courses) "is not an inevitable property of the user experience" (Carr et al., 2010). Indeed, critiques of MOOCs have shown how openness can be interpreted and enacted quite differently across courses (Hood and Littlejohn, 2016), with varying levels of rule-based and / or technological restrictions on remixing or reuse of resources (Wiley, 2015). These are important considerations in understanding the roles and practices of those involved with online course design, and in shaping the courses they

produce. For those developing online courses, roles and practices are likely to be shaped by the interaction of social forces (such as the influence of constructivist learning theory, organisational context, institutional motivations), and technical elements (configuration of open, networked, and scalable learning environments). Indeed, elements of socio-technical systems can be seen to be overlapping and "intertwined" (Kling et al., 2003) when they are examined in detail.

2.10.1 Socio-technical influences on copyright/ownership of materials

A significant area in which established practices and roles are challenged in online courses is that of ownership of course materials. Although this is not the case in every project, specific skills or levels of experience are frequently required to create protocols and maintain standards for copyright and intellectual property issues (Chao et al., 2010). Chao et al highlight the importance of this issue, yet recognize the limitations of their research in looking at only at LDs and educators in relation to it, excluding the perspectives of other key social actors from the study. Other related studies in online learning are somewhat limited in mentioning copyright and ownership as key considerations in passing (Oblinger and Hawkins, 2006), or providing only general recommendations for good practice (Caplan and Graham, 2008). Interestingly, Caplan and Graham use the term 'para-academic' in relation to this issue, which will recur in discussion of third space in HE (section 2.13). They note how LDs work in a kind of mediation role in copyright-related tasks, representing the interests of educators in presenting suitable content on the one hand, but also having to "look after the interests of the institution" in terms of gaining suitable permissions on the other (Caplan and Graham, 2008, p. 256).

The complexity of online learning projects often necessitates more collaboration in terms of the "grey area" of ownership of materials, "thus again challenging traditional [more individualistic] academic course development methodologies" (Gregory and Lodge 2015, p.214). LDs have to engage with issues of ownership and "authority to alter content" (Campbell et al., 2009, p654), once firmly the preserve of educators. As mentioned in section 2.7, Czerniewicz et al. (2016) report that educators can find copyright issues problematic as they are mediated via particular technological artefacts and organizational rules. This leads to potential frustrations and complications in course design and delivery, with educators in their study having concerns about the rigor and depth of courses where use of resources is limited by copyright. These studies raise important questions about the roles and practices of those who develop online learning materials. More research is needed on MOOCs to extend the initial understandings generated by Czerniewicz et al. as their study focused solely on the creation of a single MOOC in one institution.

2.10.2 Front ending and unbundling

Further complications in course development processes are identified in the TEL literature as the need for "-ending" (Gregory and Lodge, 2015, p.216) of course development, which is defined as the distinct need for advance preparation in TEL initiatives. This front ending often occurs via 'unbundled' roles of contributors. Gregory and Lodge (2015) explain that front-ending requires educators (and learning designers, other development team members) to complete a range of complex tasks before courses begin. Front-ending the workload in online contexts can also entail a "redistribution of power", potentially away from educators who may be concerned by "having to share or handover responsibility" for some aspects of online course development (Cowie and Nichols, 2010). Although this may to some extent reduce the need for later revisions, it clearly distinguishes online courses from conventional face-to-face modes (Sammons and Ruth, 2007) where ongoing and last-minute revisions by educators in development processes are more common. As noted above, the process of development involves collaboration between a range of stakeholders. To some extent this entails an "unbundling" of educator roles, a process which subdivides academic work into specialist functions (Kinser, 2002), and indeed the "specification of activities within each function" (Paulson, 2002, p.125).

Although the nature and extent of this unbundling can vary according to the particular institutional context, Neely and Tucker (2010) outline 'traditional' and 'unbundled' faculty models for online course development. The unbundled model includes educators operating as Subject Matter Experts (SMEs) with possible responsibilities for course delivery, whilst also highlighting instructional designers as those who align technology, materials and curriculum design. The use of online technology and the incorporation of video in particular have been identified by Gregory and Lodge as adding particular workload burdens on educators and wider course teams (2015). These studies provide ways to identify changes in online course development processes, but in light of findings on the 'bridging' and 'brokering' role of LDs in the literature discussed above, they seem to understate the complexity of learning designer roles and interactions. Nevertheless, the concept of unbundling is useful in understanding the development processes for MOOCs in HE, and leads to a wider consideration of changing academic and professional roles in section 2.12 and 2.13 below.

2.11 Unbundled academic roles in HE

2.11.1 Unbundling in the HE literature and the concept of 'para-academics'

The previous section introduced the idea of unbundling of educator roles in the technology enhanced learning literature, involving a renegotiation of power between individuals involved in online learning initiatives. The phenomenon of unbundling of roles has also been discussed in the wider literature on higher education (King and Bjarnason, 2003; Gehrke and Kezar, 2015) and reflects a challenge to the structure of academic work as "the last cottage industry" (Elton, 1996). Challenges come in the form of internal institutional and external contextual pressures (Trowler et al., 2012), many of which are relevant to the development of MOOCs. These challenges include commercialization, massification of HE, and the search for technologies to enable such change (Selwyn, 2017).

Although these pressures are seemingly more modern, it is important to recognize that wider processes of unbundling (in terms of institutional services, professional responsibilities, and instructional roles) have operated in educational contexts for "several centuries" (Gehrke and Kezar, 2015, p.97). Conceptual discussion of the impact of such unbundling on HE exists, but empirical evidence in supporting the conclusions of such research is lacking (2015, p.95). A recent review of unbundling, for example, frequently refers to MOOCs as an example of this phenomenon (McCowan, 2017), but cites no empirical studies which document it. Empirical studies are underway, however, such as those by 'The Unbundled University' project (see unbundleduni.com, 2018). According to their historical review of unbundling in HE, Gehrke and Kezar (2015) argue that the sources of pressure to unbundle roles remain consistent in terms of demands external to universities themselves and new ideas in how to enact education, rather than a solid evidence base.

External pressures on universities and catalysts to unbundling can come in the form of technological innovations. Indeed, Macfarlane's (2011, p.59) work on academic roles in HE specifically highlights the introduction of technologies into teaching and learning contexts as a further challenge to conventional academic practices. Although he identifies a range of specific positions which result from this unbundling of roles (such as research professor), more pertinent to this research are those he cites of learning technologists or e-learning coordinators as examples of those taking on academic functions in their work (see Figure 2 below). Figure 2 shows how core academic roles of teaching, research and service are unbundled, elements of which are then allocated to para-academics. The figure shows how the teaching function is sub-divided, with aspects of this function taken on by "E-learning co-ordinator" or "Learning Technologist" para-

academic roles. Indeed, a study of UK online learning recognized the need to balance centralisation of core functions such as course design and technical expertise (thus avoiding the 'cottage industry' tendency), whilst retaining disciplinary ownership and input (White et al., 2010, p.47).

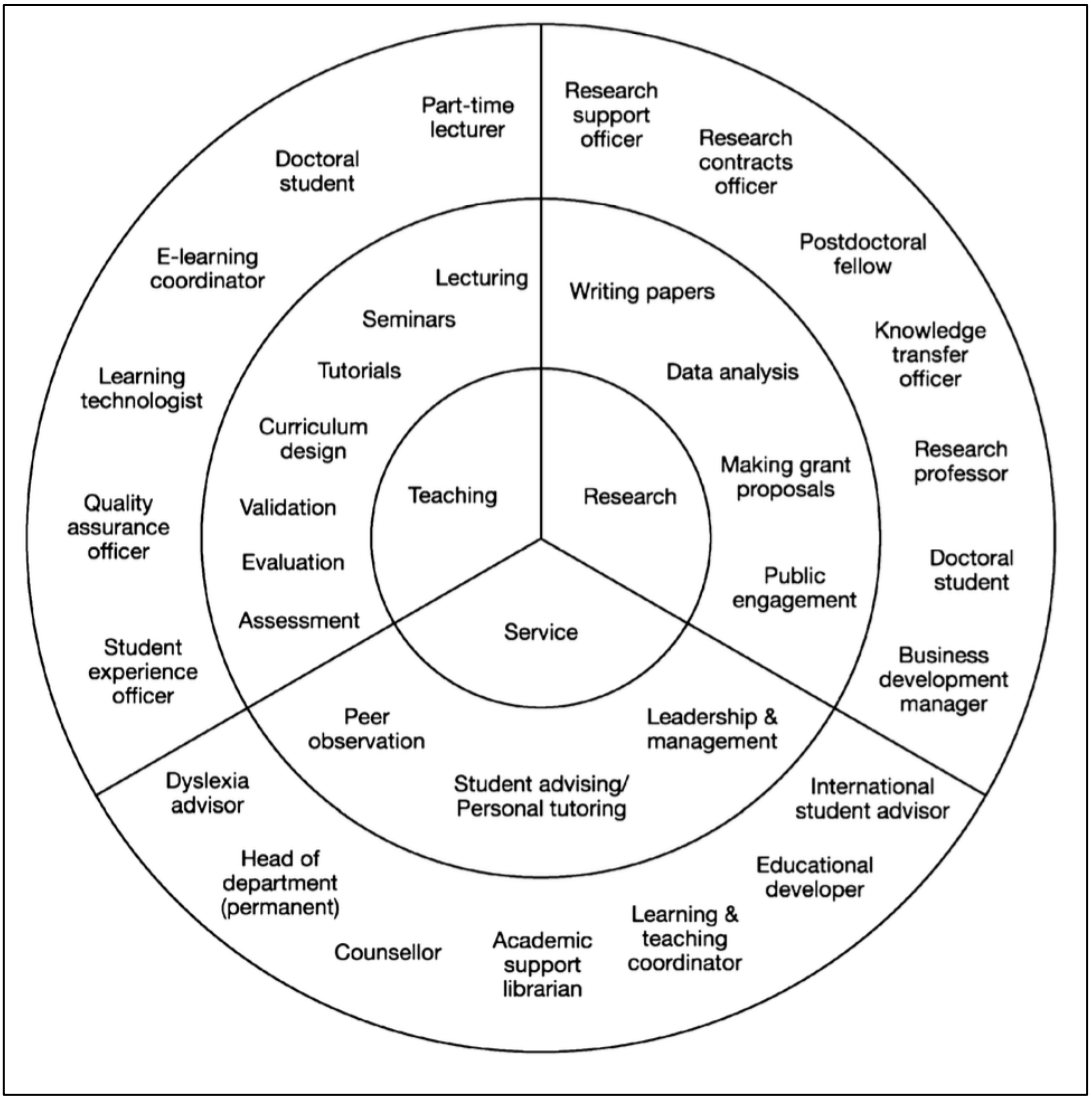

Figure 2: The unbundling of teaching, research and service roles of academics (Macfarlane, 2011)

Although some see unbundling as a 'de-skilling' process, others perceive opportunities for collaboration across university functions, and for professional development in 'support' roles. Rhoades (2007, p.6) has previously identified a fragmentation of academic roles in relation to online learning programmes, which can ultimately limit the roles of educators to that of "content experts". However, Macfarlane contends that roles in online learning require both "pedagogic and technical skills" (2010, p.63), as academic "all rounder" roles are unbundled from educators who previously operated as "master teacher" or "jack-of-all-trades" (Moore, 2007) and 'para-academics' take on portions of these roles. This means, Macfarlane argues, that institutions need to develop new methods of team working and developing "inter-professional respect" to help

individuals in new or overlapping roles work together on complex projects in HE (2010, p.66). The term *para-academics* in online learning has already been raised by Caplan and Graham (2008) (see section 2.10.3), but the concept and the need for consideration of new working practices is taken even further by Courtney (2013) in her discussion of inter-professional practice (IPP).

2.11.2 Managing changing roles through Inter-professional practice

Drawing on experience from health science education, Courtney identifies the need for strategic and well-supported 'IPPs' in learning technology initiatives in HE. This would involve recognising the status of workers such as LDs and further integrating them into the organizational structures and communication flows of HE projects alongside educators, administrators and other professionals. Defined as "effective collaborative work between different but related professions" (Courtney, 2013, p.48), the IPP approach to HE work aims to address the complexity and change which characterizes contemporary HE working environments. In common with analysis of MOOCs, advocates of IPP identify drivers such as massification, technological change, and increasing globalization and competition as relevant to their research.

Such an approach is needed, Courtney argues, in light of the "blurring boundaries" identified in studies of changing academic practices (Macfarlane, 2011) including research into the border-crossing roles of those such as academic librarians Courtney (2013) or learning technologists (Beetham et al., 2001; Oliver, 2002). The roles of LDs in these circumstances are "increasingly essential to the delivery of higher education" and need to be embedded and integrated "into daily academic work practices" (Courtney, 2013, p.46). It is clear, therefore, that use of educational technology in HE challenges established roles and practices, so new ways of understanding this working context are required. However, none of the research mentioned in this section touches on the distinctive context of MOOC development, or gives attention to the role of technology in these initiatives, despite the commonalities between the technological and social drivers of MOOC projects and those described in Courtney (2013) or Macfarlane (2011).

2.12 Para-academics and the third space in HE

If new ways of working with TEL in HE are emerging, it is important to try to conceptualize the broader structures in which such team working practices operate. In her extensive work on changing working roles and identities in HE, Whitchurch (2008, 2009, 2013) provides an important contribution in this respect. Whitchurch argues that some academic and non-academic professionals in HE are increasingly working and defining their identities within a 'third space' which disregards conventional institutional boundaries between departments and functions

(Whitchurch, 2008, 2012) in “a third, or supplementary space” (Whitchurch and Law, 2010). She explores in more depth than Macfarlane’s (2010) work the problematic binary distinction between professional and academic roles in HE, demonstrating that roles, tasks and functions in contemporary HE are more complex and intermingled than is often assumed. As shown in Figure 3 (below), this third space exists between academic and professional activity in HEIs, involving elements of academic activity, management, or other professional functions. It is in such spaces where LDs often find themselves. Figure 3 illustrates how third space projects exist in a separate space between academic and professional roles, but one which interacts with and may involve elements of those roles. This depiction of third space may be useful in understanding the position of LDs in online learning projects

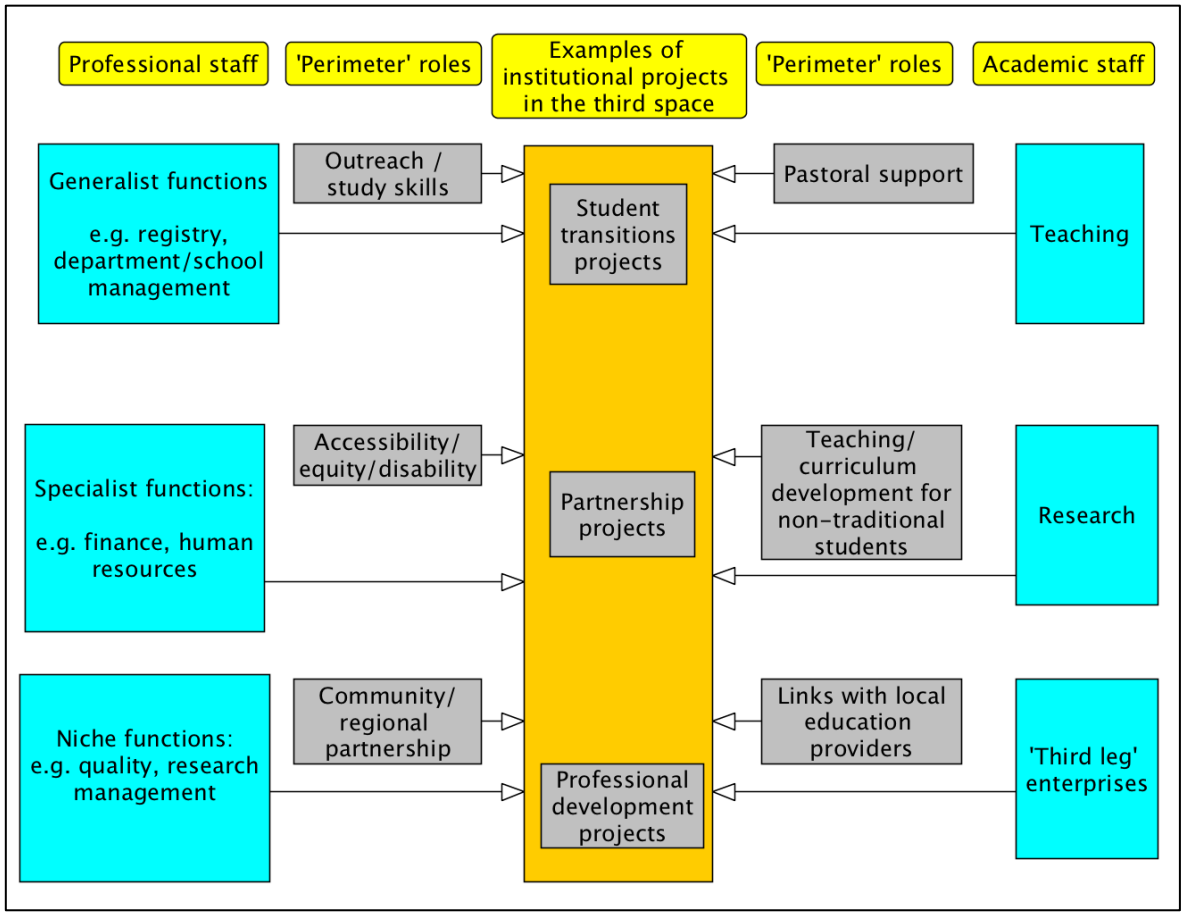

Figure 3: Whitchurch's representation of 'Third Space' activity in HE (adapted from Whitchurch and Law, 2010)

2.12.1 Comparing concepts of para-academics and third space blended professionals

In comparing the approaches of Macfarlane (2011) and Whitchurch (2013), a key difference lies in the starting point of their analyses: the former focuses on academics, whereas the latter begins with HE professionals. However, both identify the use of technology in teaching and learning as a significant area where roles and practices of academics and professionals are intertwined or

unbundled. Macfarlane (2011) depicts a novel role of 'para-academics' - individuals who take one element of the "tripartite" academic role of teaching, research and service (Macfarlane, 2011) in (for example) technology enhanced learning. Whitchurch's 'blended professionals', on the other hand, are described as those who are "recruited to dedicated appointments that span both professional and academic domains" (2009, p.3). As Figure 3 above shows, Whitchurch seeks to look at how this blended role is located within the broader organization, rather than focusing on what functions are "subcontracted" (Macfarlane, 2011, p.60) away from academics (see Figure 2). One way to foreground the difference in these two views of changing roles in HE is to look at the empirical work on which Whitchurch's ideas are based.

Drawing on primary qualitative research into HE institutions in the UK, US and Australia, Whitchurch (2008, 2009) produced a conceptual framing of blended professionals (and other HE roles) along dimensions of spaces, knowledges, relationships and legitimacies (see Table 2). Though Whitchurch explores wider 'theoretical frames' of identity via these dimensions, she also provides sub-categories of professional activities typical for each dimension which enable researchers to apply the framework to other HE contexts. For example, under the 'spaces' dimension, researchers can identify individuals whose role requires them to "offer multiple understandings of the institution" and "accommodate the ambiguities of third space between professional and academic domains", thus placing this aspect of their work within the blended professional role. These roles differ from those of 'bounded professionals' for example, whose work is defined within "clear structural boundaries", job functions and role descriptions (Whitchurch, 2008, p.382).This provides a more detailed framework with which to examine online course development roles in the third space (see Table 2 below).

Dimensions of professional activity	
Spaces	- offer multiple understandings of the institution - accommodate the ambiguities of third space between professional and academic domains - re-define, modify professional space and boundaries - work round formal structures
Knowledges	- embed and integrate professional and academic knowledge - undertake research into institutional activity - create an interactive knowledge environment
Relationships	- enter and understand academic discourse/ debate - form alliances with key partners - facilitate autonomy of own staff - construct professional networks, internally and externally
Legitimacies	- offer academic credentials - achieve credibility in academic debate/ space - challenge the status quo - manage the duality of 'belonging' and 'not belonging' to academic space

Table 2: Dimensions of professional activity of blended professionals in the third space in HE (Whitchurch, 2009)

In contrast, Macfarlane's (2011) ideas are based on a discussion of existing literature, and an analysis of roles using more general (and mutually exclusive) categories of academic research, teaching and service. The differences between the approaches of Macfarlane (2011) and Whitchurch (2009, 2012) are summarised in Table 3 below. The use of the concepts of research, teaching and service to understand academic roles has been criticized as difficult to apply, and lacking a dynamic element which recognises the interaction of the elements (Boyer 1990; Boyer

1996). This point will be taken up later (in section 2.15 on Boyer) in relation to analysis of educator practices.

The lack of interaction or overlaps between teaching, research and service in Macfarlane's model also makes it difficult to apply to MOOCs which have been linked with each element of this academic role as tools for research, learning and teaching, and outreach or widening access and participation (as part of the service function). Further, Macfarlane's approach takes no account of the impact of professional roles or identity on the work of the 'para-academics' he identifies, so provides a less holistic picture of HE interactions and practices than Whitchurch's work. As a result, the conceptual framework for this research project will draw on Whitchurch's framework for understanding third space activity as a way to understand the roles of those involved in MOOC development, though the work of Macfarlane (2011) and others on unbundling of academic roles will certainly inform the analysis and discussion.

	Para-academic (Macfarlane, 2011)	**Blended Professional (Whitchurch, 2009, 2012)**
Definition	Staff "who specialise in one element of the tripartite academic role" of research, teaching, and service (Macfarlane, 2011, p.59)	Staff who are "recruited to dedicated appointments that span both professional and academic domains" (Whitchurch, 2009, p.3)
Focus of research	Disaggregation of academic roles	Problematising the binary distinction between academic and non-academic roles
Units of analysis	Academic functions: • teaching • research • service	Dimensions of roles: • spaces • knowledges • relationships • legitimacies
Evidence	HE research literature (e.g. Coaldrake, 2001; Finkelstein and Schuster, 2001; Kinser, 2002)	Published empirical research - qualitative interviews in HE institutions in the UK, US, Australia (2008; 2009; 2012, 2013) HE and social theory research literature on 'in-between spaces' (e.g. Bourdieu, 1984; Wenger, 1998; Solomon et al, 2006)
Possible TEL roles	E-learning coordinator, learning technologist	Learning technologist, Online programme designer, e-learning and technology transfer

Table 3: Comparing conceptions of 'Para-academics' and 'Blended Professionals in HE'

Of particular practical relevance to this thesis is Whitchurch and Law's (2010) work which identifies particular narratives or processes which are characteristic of third space activity. These processes of *contestation, reconciliation* and *reconstruction* provide a conceptual framework through which "the dynamics of Third Space environments might be described and understood":

- Contestation: tensions and challenges of working across professional and academic spheres become apparent. Individuals define themselves in relation to 'rules and resources' of an institution for pragmatic reasons, but may not privately identify with them.

- Reconciliation: negotiation of difference as the possibility for fruitful collaboration emerges. Critical exchange and sharing of multiple perspectives occurs in the context of commitment to overall ideological aims of a project.
- Reconstruction: active participation of individuals toward the creation of a pluralistic environment in which new rules and resources are created in relation to the new space. New identities and networks develop, perhaps alongside new language or extended understandings of certain terms.

2.12.2 Potential limitations of the third space lens

The lens of third space activity in HE may, however, have some limitations in terms of its application and, for a project interested in the socio-technical, its apparent 'blind spot' regarding technology. Although the above third space processes are presented as sequential, Whitchurch concedes that at times they can occur in parallel, and are not, in fact, mutually exclusive. This may make applying them in practice more difficult, but they nevertheless offer an empirical basis on which to analyse MOOC development. This empirical basis is a strength of Whitchurch's work in a field where exploration of changing roles often relies on conceptual arguments and ideology (Gehrke and Kezar, 2015). However, Gehrke and Kezar also highlight the long history of such changes in HE going back some "300 years", providing a reminder that although this particular idea of third space may be novel, the creation of 'new professionals' and unbundling of established roles is certainly not a new process in HE overall.

A further potential limitation of both Whitchurch and Macfarlane's work is the fact that neither directly considers the possible role of technologies in shaping the development of academic or professional roles in HE, despite identifying technology use as an important element in this process. This thesis has argued that a socio-technical approach to understanding HE is required in which technologies and educator practices are seen as co-constructed (see section 2.11). Whitchurch and Gordon (2010) rightly claim that "institutions are subject to pressures from government and markets, [and] individuals are subject to a matrix of relationships and cross cutting strands, at the same time interpreting, yet seeking to influence, the demands being made on them" (p.136). However, in attempting to understand these pressures and relationships, their focus is solely on social factors. The matrices of relationships implicated in MOOC development are indeed significant, but I argue that technologies are part of and indeed co-construct these relational networks.

Consequently, when both Whitchurch and Macfarlane call for more fluid structures to account for a range of pressures and influences on individual and team roles in online learning projects, it is

important to also include a nuanced view of technology itself in the analysis of these projects and structures.

2.13 MOOCs in the third space

Just as MOOCs mark a departure from conventional forms of online learning (in terms of their scale and potential reach), Whitchurch (2010) argues that the third space is not simply an 'other' category which doesn't fit into academic or professional work categories, but is "a new form of space in its own right". Individuals working in these third spaces often actively interpret their own roles and are able to move laterally across functional and organisational boundaries, creating new connections, spaces, and knowledge (Whitchurch, 2008). Working in these new environments often requires skills of "networking, hybridity, flexibility, multi-tasking and media capability" (Taylor, 2008:38; in Whitchurch, 2008), so third space professionals often work to build a professional reputation around such skills. Third space work is linked to 'perimeter' roles in universities regarding outreach, access and equity, and professional development - concerns often linked to MOOC initiatives (Daniel, 2012).

A partial cause of this "convergence" or unbundling of professional-academic activities widely identified in the literature is government initiatives seeking to "link the acquisition of skills to the knowledge economy" (Whitchurch, 2010), something which the TEL literature also recognizes (Selwyn, 2017, p.23). The initiatives frequently use online learning technologies in attempts to involve a larger and more diverse population of students. They are by their nature complex, and require collaboration with a range of stakeholders, both internal and external to the university. This may particularly be the case with MOOCs, as institutions continue to grapple with questions of how MOOCs fit within existing structures and business models (Daniel, 2014; Yuan and Powell, 2013).

It is within this area of ambiguity that MOOC projects often exist. Those involved with them are often subject to conflicting pressures to create courses which fulfil institutional ambitions relating to marketing and student recruitment on the one hand (Allen and Seaman, 2014) and more philanthropic concerns of democratisation of education on the other (Yuan and Powell, 2013). As a result, the development of novel team working methods as suggested by Macfarlane (2011) and Courtney (2013) may be required in MOOC development. Indeed, Rhoades (2007) claims that management of evolving projects in HE has become 'spread' across functions/departments, so many roles are not formally recognized in organizational structures. This, according to Whitchurch and Gordon (2010, p.131) creates a clear "pressure for more fluid structures and processes".

The need for more fluid structures and ways of working has been recognized in research into the role of LDs on conventional or blended (non-MOOC) online courses (Cowie and Nichols, 2010). Indeed, Keppell's description of a 'brokering' LD role, adapted from a Community of Practice definition of a 'broker' requires LDs to:

- operate effectively in "ill-structured situations"
- interpret and explain relevant design principles / project details to educators
- maintain diverse identities (as members of various communities and committees)
- gain legitimacy amongst educators

(Keppell, 2007)

Unfortunately, Keppell's article presents limited evidence for the existence of these roles in his single institution case study (focusing instead mainly on recommendations for and descriptions of project activities). However, these key skills for LDs seem to relate well to Whitchurch's four dimensions of Blended Professional activity of spaces, knowledges, relationships, and legitimacies (see Table 2 - 'Dimensions of professional activity'). As discussed in Section 2.13, Whitchurch's work is based on extensive empirical evidence drawn from a range of HE institutions, including individuals involved with online learning. Also touching on issues related to third space theory (though not directly citing Whitchurch), a number of papers exploring the social practices of LDs in conventional online courses have claimed that LDs frequently have a diverse experience base and broad range of contacts within HE institutions (Akella, 2015; Campbell et al., 2009; Caplan and Graham, 2004). As a result, it is argued that LDs are well suited to decision-making roles in project work (Akella, 2015) and have a keen understanding of institutional priorities and values in relation to TEL projects (Campbell et al., 2009).

However, only a limited amount of empirical research into third space activity and roles has been conducted in relation to the distinct context of MOOCs. Reporting on preliminary results from the first of the three case studies in this thesis, White and White (2016a) suggest that LD activity in MOOC development does indeed occur in a third space, with LDs working with a wide range of actors in addition to educators. The 2016 study represents a preliminary attempt to introduce consideration of the way the technologies underpinning MOOCs become intertwined in these third space contexts.

Interestingly, further evidence of MOOCs as a potential site of third space activity can be inferred from research by Zheng et al. (2016). They describe the challenging nature of MOOC educators' experiences of MOOC development, highlighting "uncertainty", "vague" guidelines, potential for

"conflict" between actors and "invisible systems" linked to MOOC production. They also give voice to educators' realization that working on a MOOC is "totally different from teaching regular college classes" (2016, p.216). MOOC development, they argue, involves complex collaboration which requires either a project manager or clearer designation of authority to educators in overseeing the project. Zheng et al. do not directly reference the third space in their article, but their identification of "invisible systems", a need for collaboration and blurred or uncertain boundaries between roles resonates strongly with key signifiers of third space activity as identified by Whitchurch.

Sharrock (2017) specifically identifies MOOCs as an example of change in university courses and roles in his commentary on Australian HE. He highlights the need for more flexible organisational structures in universities which move beyond conceptions of universities as a "community of scholars" and toward a "multi-professional 'community of experts'" (2017, p.38). However, this thesis argues that consideration of the role of technology in what are socio-technical networks of relations in HE is required. Technological arrangements need to be considered alongside social relations in order to fully understand the roles of those involved and the organizational structures in which both people and technology are embedded.

2.13.1 Learning designer and educator roles in the third space

Research in this area can be linked to claims (discussed in section 2.9) in wider studies of HE that purely academic disciplinary boundaries are becoming less clearly delineated (Trowler, et al., 2012). Indeed, Macfarlane (2011, p65) notes the "coming together of different cultures, languages and assumptions" in third space contexts. It is interesting to consider the ways in which interactions between LDs and educators on MOOC projects might reflect these ideas, and both White and White (2016a) and Zheng et al. (2016) suggest that educator roles in these courses are distinct from those of face-to-face or non-MOOC online course roles. In terms of LDs, Oliver (2012, p.222) describes LDs as a relatively new academic 'tribe' whose role requires them to "cross the boundaries of disciplinary tribes, [and] to share and develop learning and teaching through the use of technology", echoing studies discussed earlier by Keppell (2007) and Cowie and Nichols (2010).

Bisset (2018) further confirms the link to LDs and the third space in a study of 'Educational Designers' which includes LDs within that term. Though the study focuses on exploration of roles themselves rather than particular projects in online learning, she identifies the "increased strategic agency" (p.15) of LDs in HE and an emphasis on "collaborative expertise" (p.14). Locating such roles in the third space, she argues, has implications for the training and development of LDs,

who need to develop "personal capacity for working in ambiguous, collaborative, and trans-disciplinary contexts" (2018, p.16). MOOCs, which provide a shared work context for these kind of collaborative interactions, are a distinctive innovation in online learning. MOOC projects have been shown to provide a space in which socio-material influences of teacher beliefs, platform architecture and disciplinary cultures interact (Bayne and Ross, 2014). This provides an interesting opportunity to look at the roles and practices of those involved in this production process, and the role of the MOOC technologies associated with the process.

2.14 Boyer and scholarly practices

The previous section has shown that the concept of third space may be well-suited to exploring MOOC development activity and the working context of LDs more generally (RQ2). However, to understand the wider implications of the involvement of educators in MOOC development (RQ3), a framework for understanding more conventional academic work is also required. The idea of the university's mission as one of teaching, research and service is well established (Daniel, 2012), and is a possible method of analysing academic practice (Macfarlane, 2011). These criteria are certainly well-established in discussion of the criteria used for promotion and reward of scholars (Parker, 2008). It is worth noting that of the three elements, the research element is widely perceived to carry the greatest weighting in promotion criteria both in the US (Harley et al., 2010, p.7), where Boyer's study (below) originates, and in the UK (NCIHE, 1997). Some change to the dominance of research is perceived in the UK context, however, as moves to recognize teaching excellence are introduced. Parker notes that in pre-1992 universities (such as those selected in this study) promotion for reader or professor posts remain focused on research excellence, whereas appointments at lecturer level balance consideration between teaching and research more equally (Parker, 2008).

Boyer's work was partly a response to narrow views of the practice of scholarship (as teaching, research and service) which can be challenging to use and fail to recognize the relationship between the elements (Boyer, 1990, 1996). He also focused more specifically on the limitations of using publication as a measure of value. This weakness could be particularly problematic in relation to the ambiguous position of MOOCs within HE, and their lack of close alignment with any of these functions. Using extensive interview data with practicing scholars, Boyer produced a four-part categorisation of scholarship outlining the fundamental functions of scholars as discovery, integration, application and teaching as outlined in Table 4 below.

Form of Scholarship	Purpose	Examples
Discovery	Producing new knowledge by conducting original research	• Publishing in peer-reviewed forums • Producing/performing creative work within established field • Creating infrastructure for future studies
Integration	Interpreting and synthesising information across or within disciplines, or over time	• Preparing a comprehensive literature review • Writing a textbook for use in multiple disciplines • Collaborating with colleagues to design/deliver a course
Application	Sharing / using knowledge to the benefit or wider society	• Serving industry/government as a consultant • Assuming leadership roles in professional organisations • Advising student leaders, thereby fostering their professional growth
Teaching	Studying teaching and learning processes in ways that can be shared, used or built on by others	• Advancing learning theory through classroom research • Developing and testing instructional materials • Mentoring graduate students • Designing and implementing a program-level assessment system

Table 4: Boyer's elements of scholarship, adapted from Nibbert, 2001

Though influential and widely cited (Boyer et al., 2015), Boyer's approach (or adaptations of it) has also been criticized for being difficult or impractical to use. Indeed, Boshier (2009) questions the proposed methods and standards for assessing Boyer's conception of scholarship outlined by Huber et al. (1997) on these grounds. He also persuasively argues against the way the elements of the model have been disaggregated and applied separately, pointing out that these elements interact. In his view, integration and discovery commonly occur within the context of teaching, whereas application occurs outside of it (see Figure 4 below).

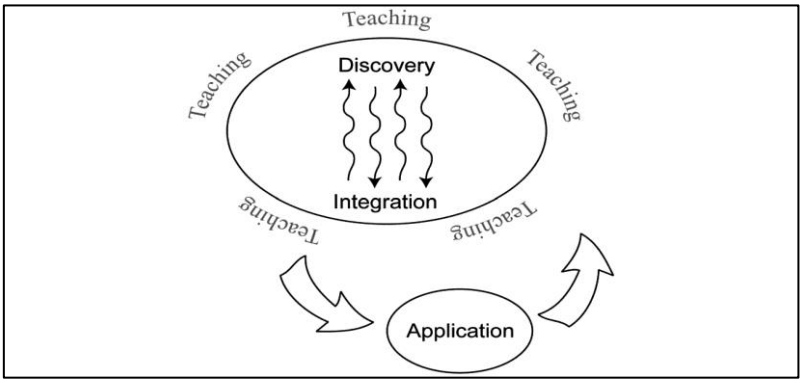

Figure 4: Representation of the interaction of Boyer's elements of scholarship (Boshier, 2009)

However, none of these criticisms detract from the utility of the categories for understanding (rather than assessing) the work of educators in this thesis. Indeed, Weller's (2011) work on technologies in universities demonstrates that Boyer's model provides a useful "basis for examining changes in scholarly practice" (2011, p.43). Bennett and Oliver (2011) also agree that Boyer's categories can be applied to scholarship in the field of learning technology itself.

Using Boyer's framework to analyse the contemporary context of UK HE, Weller highlights various "digital scholarship" activities which fall under the categories of Discovery (e.g. crowdsourcing), Integration (open access publishing), Application (blogging, video/podcast sharing) and Teaching (OER, MOOCs). Having highlighted particular digital scholarship activities, he emphasises three particular characteristics of the digital technologies used which make them useful for scholars – that they are cheap, fast and out-of-control. He explains that such technologies require little investment of time or money to produce, and can be freely distributed and shared on the Web. However, these characteristics are extremely unlikely to be found in the xMOOCs produced by many universities (mainly after his book was published). xMOOC-type courses require substantial time, resources and planning (Hollands and Thirthali, 2014), though this is not necessarily the case with regard to the earlier cMOOCs to which Weller also refers.

Nevertheless, Weller's work demonstrates that Boyer's categories of scholarship can be applied to the use of technology in UK HE. As a result, Boyer's categories of scholarship will be used to inform understandings of the relationship between MOOCs, learning designers, and wider educator practices in this thesis.

2.15 Chapter summary

The literature indicates that educators play a significant role in the development of online courses (including MOOCs), but one that is substantively different to that played in to face-to-face course development. The review has shown that the importance of collaboration in online course

development is widely recognized, and that learning designers play a crucial role within such development processes. However, understandings of the nature of collaboration in MOOCs is limited. In relation to online learning more broadly, studies of learning designers and educators in their socio-cultural context have identified learning designers as potential 'change agents' (Campbell et al. 2009) in terms of their diverse roles and means of influencing projects as they 'broker' or 'bridge' disparate groups (Cowie and Nichols, 2010; Keppell, 2007). However, portrayals of learning designers (or indeed MOOCs) as change agents must be considered critically, and with appropriate attention to the interplay of social and technical factors. Part of this LD role is to adapt to the "shifting needs of HE" (Chao et al. 2010), and such shifts are likely to be both social and technological in nature.

The review has drawn together research from the fields of TEL and HE studies to identify concepts of unbundled roles and 'Third Space' activity as particularly important for understanding the roles and practices of those involved in the production of MOOCs. When online course development entails the unbundling of educator roles, a consequent renegotiation of power and control with learning designers (and others) occurs. Whitchurch (2013) argues that the site of this renegotiation for online learning projects is a third space in HE, yet the focus of third space research has hitherto remained purely social, with no attention to the role of technology in such spaces. It is argued that understanding educator roles and practices in MOOC development is only possible by examining the social contexts in which projects are embedded and the technologies with which they intertwined. This approach is notably missing from the literatures on MOOCs.

As a result, an approach which can account for both social and technical elements of the construction of MOOCs in HE is required. The following section outlines the theoretical basis for an inter-disciplinary Web Science approach, which is grounded in research from the field of education (studies of TEL and third space in HE as discussed in this section) and empirical work from the field of Social Informatics.

Chapter 3: Theoretical framework

This chapter outlines the theoretical underpinnings of the research project in relation to an interdisciplinary, Web Science approach. The first section outlines the importance of the Web for education, and how an interdisciplinary, Web Science approach is required to understand the Web (and specifically MOOCs) as a complex socio-technical phenomenon, rather than a simple technical tool.

The second section introduces approaches relevant to researching and understanding technologies in education, including studies of Technology Enhanced Learning (TEL) and MOOCs in particular. It explores gaps in this literature and the discipline of Social Informatics (SI) is proposed as an area of empirical research which provides an established framework for understanding the relationship between technology and change in organisations from a socio-technical perspective. The main assumptions underlying this discipline are outlined, as are important findings from the SI literature. This leads to a discussion of the STIN analytic strategy as a practical method of applying understandings from SI to the study of MOOCs in UK HE.

The links between SI/STIN and other relevant socio-technical or sociomaterial approaches are then explored in discussions of the Social Construction of Technology (SCOT), Actor-Network Theory (ANT), and Activity Theory (AT). Although each approach is recognized as contributing useful sensitising concepts for a study of MOOCs in HE, the STIN analytic strategy is identified as particularly applicable to the aim and practicalities of this research project. Finally, the possible weaknesses of STIN are considered in relation to the research design of this thesis.

3.1 MOOCs and the Web

MOOCs are seen as distinct from other innovations in online learning because of their open and scalable nature (Glance, Forsey and Riley, 2013). These courses demonstrate how the original conception of the Web as a simple, flexible and open distributed hypertext system (Berners-Lee, 1989) has been interpreted and developed over time. Experts in online learning have noted the importance of the Web for education in affording interaction, communication and participation, but have also highlighted how new educational methods, social norms and practices have emerged in relation to Web technologies (Anderson, 2008). For example, the kind of large scale social learning opportunities explored in MOOCs demonstrate how pedagogies, technologies and the broader context of education are inter-related and co-evolve over time (Dron and Anderson 2014).

The concept of the interaction of technologies, social practices and social contexts over time goes to the heart of arguments for the discipline of Web Science in which this research is rooted. Web Scientists perceive the Web as an assemblage of mutually shaping relations between social actors and Web technologies (Halford et al., 2010) within a wider social, political or economic context. Such processes of mutual shaping result, for example, in the diverse realizations of openness apparent in MOOCs (see section 2.11 – Taking a socio-technical perspective on online learning). Web Science is a relatively young discipline (Berners-Lee et al., 2006), and draws on interdisciplinary methods to develop a deeper understanding of Web phenomena than either solely social or technical perspectives might achieve (see section 2.8).

3.2 From Social Informatics to STIN

3.2.1 Commonalities of Social Informatics and Web Science

Social Informatics (of which STIN is a part) and Web Science perspectives share a common focus in looking at how particular information systems or technological artefacts (Web systems and artefacts in the case of Web Science) shape and are shaped by their contexts of use. Indeed, Social Informatics is concerned with the interaction of ICTs and their cultural or institutional contexts, and how this shapes design, use or consequences of ICT implementation (Kling et al. 2005, p.6). This socio-technical focus seems to parallel that of Web Science, which views the Web as a socio-technical phenomenon "brought together ... by people, historical contexts, antecedents, (sub-) cultural norms, and expectations" (Carr, Pope, and Halford, 2010). The connection between these diverse elements is the main focus of social informatics researchers, who want to examine "the hyphen connecting the social to the technical" (Meyer 2014, p.57).

To examine the connection between the social and technical, both SI and Web Science require interdisciplinary approaches. Indeed, both call for the incorporation of relevant social theory into studies of technology and embrace methodological pluralism (Tinati et al., 2012; Kling et al., 2003) where this strengthens the rigor and depth of research.

3.2.2 The aims of Social Informatics

In its broadest form, Social Informatics research explores the relationship of information and communication technologies to social and organisational change (Kling et al. 2005, p.54). To do this, it draws on interdisciplinary influences to examine how ICTs work in practice and in context (Haythornthwaite, 2006). It is claimed that this approach contrasts with previous studies in the field which rely on "simplistic, deterministic arguments" on the impacts of technology on society

(Sanfillippo and Fichman 2013, p.9) and the link between social change and technologies (Kling, 2000). This rejection of technological determinism highlights a further point of commonality with a Web Science approach.

3.2.3 Themes of Social Informatics: Embeddedness, duality, configurability

The Social Informatics approach, then, attempts to gain more nuanced understandings of the actual, situated, context-dependent use of technology, revealing unforeseen consequences of processes of technology development, implementation and use (Meyer, 2007). The discipline is pluralistic in terms of methods (Sawyer and Eschenfelder, 2005), but has produced a relatively stable overall understanding of the nature and consequences of technology use within organizations. According to Kling et al. (2005), a highly influential figure in the field (Sanfillippo and Fichman, 2013), empirical research in social informatics reveals three main themes in the use of technology in organizations which are central to such research:

Embeddedness - ICTs are situated, and located in socio-technical networks, rather than isolated from their contexts. Such networks are located within still larger information ecologies, and both networks and the larger ecologies consist of interrelated elements including people, roles, values, practices, norms etc (Kling, 2007).

Duality - technologies and society are co-constructed and "highly intertwined" (Kling et al., 2003, p. 54), having "enabling and constraining effects" (Kling et al, 2005, p.54). In this way SI takes a pragmatic stance in rejecting both socially and technologically determinist perspectives. SI recognizes the importance of social and organisational context, and of social actors (rather than passive 'users') within these contexts in shaping technologies and the practices associated with them. However, Kling supports the utility of "concise characterizations of a technology" as a "legitimate element of serious sociological narratives" (p. 59). As discussed in section 2.8, this presents an epistemological challenge from a constructivist perspective in terms of claiming "unproblematic, direct access to the 'true nature' of technology" (Oliver 2011, p.382). However, Kling contends that "physical objects like guns and roses have some capabilities that are not only arbitrarily derived from the talk about them" (Kling, 1992) and that some attempt to consider them should be made in order to balance social and technical concerns. The SI perspective therefore avoids identifying technologies as direct causes of particular social effects, but importantly recognizes the mutual shaping forces at play when technologies are used in particular social contexts.

Configurability - technologies can perform different roles and indeed be understood differently depending on the circumstances, thus at times producing unpredicted or unexpected

consequences (Kling et al., 2003). The configurations of technology which emerge in particular contexts are the result of a range of actions and structural properties at play in those particular contexts (Sawyer and Tyworth, 2006). The social informatics approach aims to take this range of factors into account in order to generate a nuanced understanding of the form and use of technologies within organisations.

These themes are derived from substantial SI research, and form the basis for further conceptual development in subsequent studies. One such development is the useful idea of "social actors". This concept allows analysis of ICT use in organisations to move away from the implications of the "socially thin" term 'user' to describe those involved with or affected by the introduction ICTs (Lamb and Kling 2003, p.197). SI studies reveal that rather than being passive users of technology, social actors have multiple roles and participate in "interactions which are simultaneously enabled and constrained by the socio-technical affiliations and environments" of which they are a part (Lamb and Kling, 2003, p.218). This idea of social actors is adopted and applied in STIN research, as will be discussed in section 3.4.

3.2.4 Significant Social Informatics findings

The SI themes of embeddedness, duality and configurability were synthesised from considerable empirical research efforts. These overarching themes were derived from more specific findings about the social, technical and institutional nature of technology use in organizations (Kling et al., 2005). Although the specific findings are numerous, a literature review of the field conducted by Sawyer and Eschenfelder produced a summary of the main findings as follows:

1. ICT uses lead to multiple and sometimes paradoxical effects.

2. ICT uses shape thought and action in ways that benefit some groups more than others and these differential effects often have moral and ethical consequences.

3. A reciprocal relationship exists between ICT design, implementation, use and the context in which these occur.

(Sawyer and Eschenfelder, 2005, p.438)

A later review by Sanfillipo and Fichman (2013) extends this understanding by highlighting a strand of critical informatics which initially focuses on the moral or ethical aspects of ICT use, whilst inevitably going on to consider the reciprocal relationships and paradoxical effects often associated with technology use in particular social contexts. These findings are relatively well established in the research literature, thus suggesting that employing an SI approach in this

research project could be useful in highlighting the socio-technical consequences of introducing MOOCs into HE contexts.

3.2.5 The development of Social Informatics towards STIN

In addition to the themes and findings mentioned above (section 3.3.4), concepts of social shaping, structuration and networks have been significant in SI and are pertinent to this study. These concepts have emerged over time in SI research, as demonstrated in Sanfillippo and Fichman's review of the development of the discipline (2013). They show how early SI work, like that of SCOT, drew heavily on the concept of social shaping (and rejected technological determinism). The sociological concept of structuration was subsequently adopted and adapted as the field developed, taking a more nuanced view on the interaction of humans with technology. Such thinking draws on the ideas of Orlikowski (2000), who argued that rather than having fixed, inherent structures, technological structures are enacted or emerge as part of wider social practices of technology use. This idea informed thinking on the complexity of socio-technical processes and the interactions implicated in these processes.

In order to examine and model such socio-technical interactions further, the idea of networks was subsequently incorporated into SI research (Kling, 2000; Kling et al., 2003). This contributed further to socio-technical understandings of technology use and development as one of mutual shaping. Between 2000 and 2005, Sanfillippo and Fichman identify this move toward the identification of networks, particularly in the work of Rob Kling, as significant in understanding technology use in organisations. The use of this network perspective allowed researchers to see social actors, technologies, social groups, resources, and other elements of organizational arrangements as interacting nodes in a network. As this research project seeks to understand the relationship between learning designers, educators and MOOCs in the complex context of HE, such a socio-technical, network-based perspective is worthy of consideration. The following section will therefore examine the sub-field of socio-technical interaction networks (STIN) for its potential as a research strategy in this regard.

3.3 Socio-Technical Interaction Networks

Having discussed the main features of Social Informatics (the field from which STIN has developed), this section outlines the aim, nature, and implementation of the STIN strategy. It also identifies potential weaknesses of the strategy, and notes other perspectives which could be used to investigate the research problem. This discussion will justify the suitability of the STIN strategy

as a means of exploring the development of MOOCs in HE and their relation to educator and learning designer roles and practices.

3.3.1 The origin and aim of STIN

In alignment with the aims of this thesis and of Web Science more broadly, the analytic approach of Socio-Technical Interaction Networks (STIN) is proposed as a way to understand "socio-technical systems in a way that privileges neither the technical nor the social" (Meyer 2006, p.37). STIN is rooted in Social Informatics, and has a clear sensitivity to the SI themes of embeddedness, duality and configuration of technology in context mentioned in section 3.3.3 above. Despite its origins in SI research, Meyer (2014, p.61) notes that STIN also builds on related insights from perspectives of the Social Construction of Technology (SCOT) (Pinch and Bijker, 1984) and Actor-Network Theory (ANT) (Latour, 1987) as will be discussed in section 3.4.8. To categorise it precisely, STIN is defined as an "analytic strategy" or an action plan aimed at a particular goal (of understanding a particular socio-technical technical system), rather than a methodology or fully developed theory (Meyer, 2006, p.44).

One strength of the approach is its nuanced view of technology and resultant ability to unearth unexpected consequences of the introduction of technologies into particular contexts. Indeed, Walker and Creanor (2009, p. 306) note that STIN studies are well-suited to mapping "the complexity of introducing new artefacts into existing networks, where outcomes are frequently unpredictable and may propagate through wider networks to have effects often far removed from the original intentions". The capability to reveal such insights comes from an awareness on the part of SI researchers of the limitations of the 'standard tool' models of technology (Kling, 2000; Kling et al., 2003) which can achieve prominence in some research literatures and the popular media. Standard tool models in their strong form tend to be technologically determinist (see section 2.8), positioning technologies in isolation from, and having effects upon passive users. Weaker forms of this model over-simplify the relationship between technologies and their contexts of use, for example by selecting a pedagogy to fit a technology, or vice versa (Creanor and Walker, 2010, p.3).

3.3.2 The nature of the STIN strategy: networks as a metaphor

Having categorized STIN and located it in relation to other approaches, it is useful to look at the nature of the strategy in more detail. Scacchi (2005, p.2) provides an overview of STIN as "a conceptual framework for identifying, organizing and comparatively analysing patterns of social interaction, system development and the configuration of components that constitute an

information system". These patterns are conceived of as metaphorical rather than literal networks, in order to help illustrate the ways that technologies (such as MOOCs) are embedded and co-constructed within complex socio-technical systems.

In their seminal work on the analytic strategy, Kling et al. (2003, p. 48) define a STIN as "a network that includes people (money, skill, status), documents and messages, legal arrangements, enforcement mechanisms, and resource flows". Thus, the STIN strategy provides a practical means of unearthing the connections and relationships involved in the introduction of new technologies, and of highlighting the perhaps unexpected consequences of such initiatives. Mapping the overlapping, "multiple, interacting influences" (Walker and Creanor 2009, p.305) in such networks can be challenging, and such studies typically employ in-depth qualitative research design (Sawyer and Eschenfelder, 2005) of the kind used in this thesis.

3.3.3 Key STIN assumptions and findings

As a sub-field of Social Informatics, an underlying principle of STIN is derived from the considerable empirical research in SI: "ICTs do not exist in social or technological isolation" (Lamb et al., 2000). Although SI and STIN are not as widely used or cited as other comparable approaches such as the Social Construction of Technology or Actor Network Theory (Meyer, 2014), a range of studies relevant to this thesis have been conducted. The "fundamental assumptions" which provide a foundation for these studies are listed by Kling et al. as follows:

1. The social and the technical are not meaningfully separable

2. Theories of social behaviour … should influence design choices

3. System participants are embedded in multiple, overlapping and non-technologically mediated social relationships so may have multiple, conflicting commitments

4. Sustainability and routine operations are critical … in determining design

(Kling et al., 2003, p.56-7)

Although many STIN studies focus on governmental, commercial or media contexts (Robbin, 2007), STIN has been used in relation to HE or education more generally. Most relevant to this thesis, Villar-Onrubia (2014) has investigated the adaptability of Open Educational Resources (OER) initiatives using STIN methods whilst also drawing on social theory from the field of practice theory to understand the relationship between educators and OER. He found that the socio-technical networks in which OERs were embedded in particular institutions had a marked effect on levels of lecturer engagement with OER. The network elements included individual motivations

and incentives, institutional mission and priorities, communication protocols, OER design or quality requirements). White and White (2016a) also argue for applicability of the STIN analytic strategy for investigating issues of openness, scholarship, pedagogy, and learning designer roles in relation to MOOCs (though this is a proposal for a research agenda, not an empirical study).

Studies in other HE contexts include research into the sustainability of technologies among research communities (Kling et al., 2003) and the unexpected consequences of introducing novel technologies into a particular (and under-researched) field (Meyer, 2007). These concerns with the sustainability and consequences of introducing novel technologies are directly applicable to UK HE setting and the aims of this thesis. In other education-related studies, STIN research has continued to develop understandings of the ways technologies become embedded in, and have unexpected consequences for particular social contexts. Such studies focused on unexpected and subversive learner use of networked learning tools (Creanor and Walker, 2010), increasing understandings of the functions of social reference websites (Shachaf and Rosenbaum, 2009), and methods of collaboration in social media (Taylor-Smith and Smith, 2016). These studies demonstrate the use of STIN to explore the socio-technical implications of using technologies in complex social contexts, and this thesis aims to apply this method to MOOCs in UK universities.

3.3.4 Implementing STIN: Avoiding the 'standard tool' model

The STIN strategy is mainly targeted at understanding ICTs in routine use, and so is well-suited to the focus of this study of MOOC development in HE. STIN follows Social Informatics in relying on "rich empirical data" (Lamb and Sawyer 2005, p.10) to provide nuanced portrayals of the roles and meanings of technologies in organizations. As a means to generate such rich data, both SI and STIN explicitly encourage the use of social theories and qualitative research methods of the kind used in this thesis. Consequently, the STIN approach provides a way to avoid slipping into simplistic, technologically determinist accounts of tools and their effects on passive users (see section 3.4.4). Indeed, since 2000 STIN researchers have contrasted their empirical findings with those of common 'standard tool' models (Kling, 2000; Kling et al., 2003) which "oversimplify the processes of ICT design and use" (Creanor and Walker 2010, p.3). This standard tool model persists in accounts of the effects of ICTs on society found in both scholarly and more popular media, including predictions and commentary related to technology in education (Selwyn, 2010) and specifically MOOCs (Weller, 2015).

3.3.5 Implementing STIN: a socio-technical lens to understand MOOCs

As discussed in section 2.3 ('MOOCs as drivers of change'), MOOCs do not 'fit' neatly into the core functions of universities, so using a holistic, socio-technical lens to understand their place in HE is prudent. The SI literature demonstrates that human "behaviour is not simply dictated by a particular technology or artifact" (Creanor and Walker, 2010, p.4), and therefore investigating the introduction of MOOCs into UK HE contexts needs to take a range of social and technological factors into account (Walker and Creanor, 2009, p.18). For this reason, the qualitative or mixed methods approaches typically used in STIN studies align well with the overall social constructivist epistemology underlying this study (see section 4.2). What's more, STIN research has highlighted the limitations of discourse concerning the Internet and education which represents "efforts to co-constitute new kinds of universities by changing their ICT infrastructures and pedagogies" (Kling, 2000, p.221). Such a view has certainly been identified in discourse concerning MOOCs in the years 2012-2014 (Bulfin et al., 2014; Weller, 2015). In order to resist these 'standard tool' models of the role and meaning of ICTs in education, the STIN strategy sets out a set of questions or "heuristics" (Kling et al., 2003) which help researchers to develop a more nuanced understanding of the realities and potential consequences of introducing new technologies such as MOOCs into an educational context.

3.3.6 Implementing STIN: a set of heuristics

As described above, STIN uses a set of heuristics to explore "patterns and routines of [technology] use" by taking into account the complexities of both the technologies and the contexts in which they are embedded. This focus on patterns and routines of technology use makes STIN particularly well suited to this thesis with its interest in the roles and practices of those involved with a new technology (MOOCs).

The heuristics are framed in Kling et al.'s (2003, p. 57) seminal paper on STIN as:

1. Identify a relevant population of system interactors
2. Identify core interactor groups
3. Identify incentives and impediments
4. Identify excluded actors and undesired actions
5. Identify existing communication forums
6. Identify system architectural choice points
7. Identify resource flows
8. Map architectural choice points to socio-technical characteristics

Following similar studies which use the STIN analytic strategy (Walker and Creanor, 2009; Meyer, 2007), the heuristics are adapted to the particular research focus and context of this thesis in Research Question one as follows:

a) What is the relevant population of system interactors and groups involved in developing and using MOOCs?
b) What are the incentives, pressures and impediments related to development and use of MOOCs?
c) Which actors are involved for the first time, which actors are excluded and which actions become undesirable in relation to MOOC development and use?
d) How do educators and learning designers learn about MOOCs and the gain skills needed to develop them?
e) What are the resource flows in relation to MOOC development and use?
f) What are the architectural choice points in MOOC development and use?
g) How do the architectural choice points map to the socio-technical characteristics of the system?

Though not intended to be a prescriptive list, this study broadly follows this set of steps to guide data collection and analysis (with some adaptation / elaboration on questions in the interview guides – see Appendix A). In this thesis, the aim of this procedure is to ultimately "map some of the key relationships between people and people, between people and technologies, between technologies and their infrastructures, and between technologies" (Kling et al., 2003, p.49) in the three case study locations. The strategy includes considerations of both people (as 'social actors') and a range of 'non-human actants' which can "influence the range of actions of other actors and actants" in a system, potentially with long-term implications (Meyer, 2007, p.175). These actants might include particular technologies, but also resources, agreements, contracts and even broader policy frameworks. STIN does not go so far as Actor-Network theory in assigning agency

to such actants (Latour, 1987), rather focusing on networks of interactions as a way to show how the social and technical are "highly intertwined" (Kling et al., 2003). Using these techniques and concepts, this thesis is able examine the ways learning designer, educators and other social actors linked to the HE context interact with MOOCs in a process of mutual shaping. This approach aims to obtain insights into the roles and practices of these social actors in their interactions with MOOCs.

3.3.7 Advantages of the STIN strategy: Sensitivity to excluded actors, choice points, and sustainability

The STIN strategy has particular strengths in revealing insights into excluded actors and architectural choice points related to technology use, whilst also considering the degree of sustainability of particular socio-technical arrangements. It helps foreground processes of mutual shaping by taking a socio-technical perspective on the social actors in organizational contexts and these architectural choice points which emerge as new technologies are introduced. Particularly revealing, according to some researchers, is STIN's ability to identify social actors who become marginalized or excluded from the networks as technologies and social relations become intertwined. Indeed, Meyer (2014, p.64) argues that "understanding who is either systematically excluded from a socio-technical construct, or is excluded during the process of change … can be key to understanding how technology has entered normal use".

Related to the exclusion of particular social actors, STIN studies also explore whether certain practices become less desirable as technologies become embedded in their wider organizational contexts. This attention to excluded actors or actions, it is claimed, confers advantages on STIN over other Science and Technology Studies methods for the purposes of investigating practical technology use (Meyer and Schroeder, 2015) and making "the unobvious, the taken-for-granted, and the ignored explicit, problematic, and visible" (Robbin, 2007, p.245). Whilst some actors may be excluded from systems of technology use, others who may be perceived as marginal to activities can be revealed as significant. Indeed, Eschenfelder and Chase (2002) have found that seemingly peripheral actors can become influential in unexpected ways in novel socio-technical systems, an idea the findings of this thesis support.

By focusing on architectural choice points, STIN provides insight into the realities and consequences of technology use. Exploring architectural choice points allows researchers to identify the "technological and social drivers" (Meyer 2014, p.65) behind the ways in which technologies become embedded in their contexts, and how particular patterns of use come to exist. Although other perspectives could of course reveal choice points or significant and excluded

actors, Meyer goes on to argue that the STIN approach increases the likelihood of making these discoveries, and as such the STIN strategy seems well aligned to the aims of this thesis. These techniques allow researchers to exploit periods of change as rich sources of understanding, highlighting how decisions, decision makers (and those excluded from them) form part of a socio-technical system of technology use in context.

Using the STIN strategy in an educational context provides a nuanced view of technology in its social context, whilst offering practical insights to stakeholders in education interested in the sustainability of technologies. Studies in education tend to recognize the complexity of universities and the internal and external forces which operate upon them (Trowler, 2012). However, as discussed in section 2.7 they frequently take somewhat simplistic views of technology which exhibit a "blindness" to the mutually constitutive interaction of technologies and practices (Brown, 2016, p.5). In contrast, STIN aims to reveal "the complexity of introducing new artefacts into existing networks, where outcomes are frequently unpredictable and may propagate through wider networks to have effects often far removed from the original intentions" (Walker and Creanor, 2009, p.3).

STIN studies also have normative elements, allowing researchers to focus on the sustainability of technology use in social contexts. This concern with sustainability (Kling et al., 2003; Meyer, 2006) is of practical relevance to this thesis, and may produce insights of relevance to learning designers and educators affected by MOOCs, and to wider debates about the future role of MOOCs and online learning in HE (Marshall, 2014; Sánchez-Vera et al., 2015). The practical approach which underlies STIN (Meyer 2006, p. 44) reflects, to some extent, this sensitivity to the sustainability of technologies in organizations.

As the above discussion implies, the nature of the relationships mapped in STIN networks can be numerous and complex (Walker and Creator, 2009, p. 305). Consequently, simplified diagrams of such networks are typically used as representations, rather than attempts to comprehensively communicate the full nature of particular social relations or the import of a particular policy or document. Figure 5 (below) provides an example of a simplified STIN diagram of MOOC development at University A in the study. The diagram shows early stage MOOC development at UA - at this point the full range of relevant actors and non-human actants who become involved in more mature MOOC projects had yet to be identified. The diagram identifies (in orange) educators, learning technologists and management as the main university-based social actors involved with the courses, and also includes consideration of MOOC platform representatives as social actors external to the university (in green). The MOOC platform and strategic decision

making on the part of management (choice of course subjects, organizational structure) are also shown as relevant non-human actants in the network.

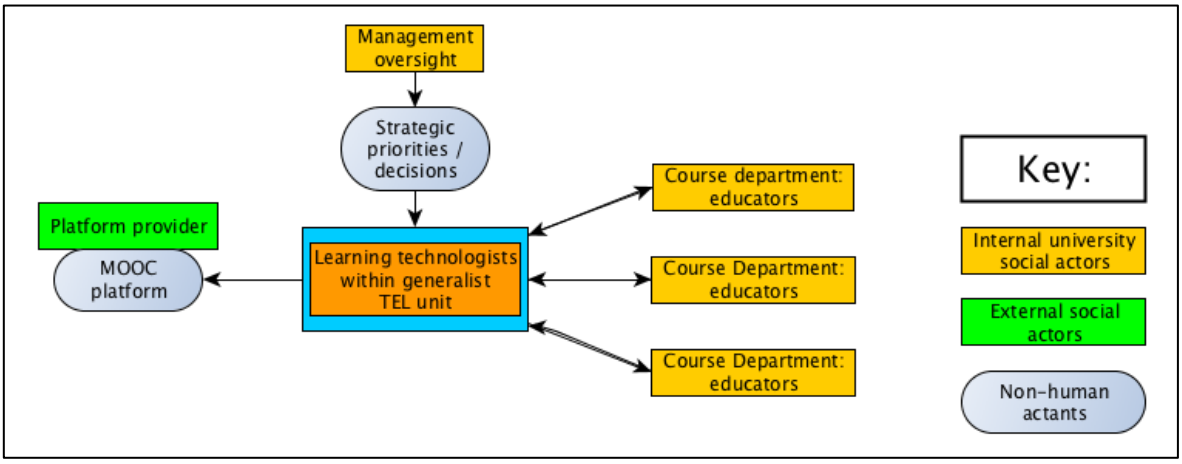

Figure 5: Example STIN diagram of MOOC development at University A

The specific questions used to construct a representation of a STIN for MOOC development are based on STIN heuristics as outlined earlier in this section.

3.3.8 Alternative approaches: SCOT, ANT and AT

SI and more particularly STIN have been identified as well-suited to the purpose, methods and underlying epistemology of this thesis. This section briefly highlights the potential of Social Construction of Technology (SCOT), Actor-Network Theory (ANT), and Activity Theory (AT) to contribute to research into how technologies in education are developed and adopted in their social contexts. It is important to recognize that other approaches could also be appropriate for research of this kind. Indeed, in-depth discussion of the usefulness, similarities and differences between SI, SCOT and ANT have appeared in the literature related to STIN (Creanor and Walker, 2010; Meyer, 2006), and in the broader TEL literature such discussions have also included AT (Oliver, 2011).

3.3.8.1 Social construction of technology

Building upon sociological ideas of the social construction of reality (Berger and Luckmann, 1966), and especially from work in the area of the sociology of scientific knowledge (Sismondo, 2010), SCOT emerged in the early eighties. It draws on constructivist thinking (Bijker, 2010), and argues that technological developments result from a process of contestation between competing social groups, each attempting to advance their own interpretations of how technologies are used or understood (Pinch and Bijker, 1987). As with SI research, SCOT researchers reject technologically

determinist thinking, objecting to the idea that "technology develops autonomously" and "determines societal development to an important degree" (Bijker 2001, p.15523).

In place of technological determinism, concepts of relevant social groups, interpretative flexibility, stabilization, closure and (added later) interpretative frames help to foreground important elements and processes within technological systems. Relevant social groups are identified (by the fact that they refer to a particular artefact as it develops), and analysis of differences between meanings attached to the artefacts by these various groups demonstrates their interpretative flexibility. As initially diverse interpretations of artefacts diminish (particular versions/alternatives of artefacts come to dominate), processes of stabilization and finally closure are enacted in which an 'end point' among alternatives is reached (Bijker, 2010). The concept of technological frames was introduced as the approach developed in order to give some consideration to the wider social context, but also to the artefact and thus give at least some recognition to "the influences of the technical on the social".

The concepts of interpretative flexibility and relevant social groups have been incorporated into SI research, including in STIN. These are just two of many useful "sensitizing devices" or concepts (Robbin 2007, p.244) taken from other theories and used in Rob Kling's work on SI and STIN. Some educational researchers have criticized SCOT for having an underlying social determinism (Oliver 2011). The SI literature attempts to rebalance this perceived over-emphasis on the social by arguing that "concise characterizations of a technology should be legitimate elements of serious sociological narratives" (Kling 1992, p.381). This, however, entails potential epistemological difficulties in constructivist studies where claims to "unproblematic, direct access to the 'true nature' of technology" (Oliver, 2011, p. 382) are problematic.

One solution to this problem has been to refocus analysis on the way a "messy mix" of natural, social or technical phenomena "become assembled and enacted in networked webs, how they associate and exercise force, and how they decline and mutate" (Fenwick et al., 2011, p.94). This approach is known as Actor Network Theory, and the following section will briefly summarize and evaluate its aims and methods.

3.3.8.2 Actor-network theory

Actor-network theory has been categorized as a subset of broad understandings of SCOT studies (Bijker, 2010), and shares with it a rejection of technological determinism in its empirical observations of the development of socio-technical systems. As such it is useful to consider possible contributions of ANT to this study. According to theorists, it is difficult to present "the objectivity of an overall view" of ANT (Law 2009, p.142), and commentators resist attempts to

"treat it as an 'it' that can be known and contained" (Fenwick et al. 2011, p.95). However, scrutiny of the literature reveals some broader insights into the aims and key concepts of ANT.

According to Fenwick et al. (2011, p. 96), the aim of ANT is "to describe the specificities of how things come together – and manage to hold together – to assemble collectives or networks that produce force, agency or other effects". This orientation is applicable to studies of how technologies come to be (Orlikowski, 2000) and more broadly how networks of practices are formed in educational contexts (Fenwick et al., 2011). As its name suggests, these networks are an important focus of ANT studies, which aim to demonstrate that various entities or objects can be drawn together, ultimately becoming "relational effects" of these networks (Fenwick et al., 2011, p. 103). Certain concepts, some quite radical, are important in understanding the formation or maintenance of these networks, and the most pertinent to this research project are the ideas of translation and symmetry.

ANT has been described as the 'sociology of translation', including in Latour's seminal work on 'Science in Action'. Translation can be broadly understood as an unpredictable process in which entities (people, objects, knowledge, organisations etc) act upon and change each other as nodes in a network. The interaction between entities (actants) can result in the formation of a coordinated network (actor), which is capable of exerting certain kinds of force. The concept of symmetry becomes relevant here, as all entities in ANT (whether human or non-human) are treated equally as effects such as force or agency (Hanseth et al., 2004), with a focus on what things do, rather than what they mean (Fenwick et al., 2011). This element of ANT has been controversial (Murdoch 1998, for example criticises the concept for ignoring human capacities for meaning-making and intentional acts). However, ANT theorists argue for its utility in "decentring human intention and agency as the engine of society and history" (Fenwick et al., 2011, p.96).

These ideas of symmetry and translation help build on the SCOT concept of closure of technological artefacts (where interpretations and understandings coalesce on more stable forms for objects). Processes of translation, ANT theorists argue, allow for boundaries to be drawn around sub-networks, establishing common understandings of a sub-network and fixing it (though not permanently) as a 'black box' of which a particular "performance" is expected (Kaghan and Bowker, 2001, p.258). Both human and non human entities are active in processes of translation, which are ongoing.

A range of debates exist on various aspects of ANT, such as how agency and action are understood (see Bruun and Hukkinen 2003, for example). Nevertheless, Meyer (2007 p.59) argues that STIN can benefit from "exporting useful concepts from ANT". ANT itself has a well developed, highly abstracted theory of the ontology of networks (Guggenheim and Nowotny, 2003), and

some very specific methodological prescriptions for analysis techniques. However, it intentionally lacks 'mid-range' theory (Bijker, 2007; Law, 2008) of the kind that can be applied to practical questions of the kind in this thesis as it rules out comparing across cases (each use of technology is seen as totally contingent on particular circumstances).

As a result, the use of STIN in this thesis follows Meyer (2007) in seeking to incorporate useful ideas such as 'actants' into the STIN strategy in order to benefit from 'sensitizing devices' within the more practical, pragmatic framework of an SI study (Meyer, 2006). The practical focus on technology use in STIN is also more appropriate in this thesis:

> Latour theorizes about how technologies come to be; Kling and Scacchi theorize about how new technologies come to be used.
>
> **(Orlikowski and Iacono, 2001, p.126)**

3.3.8.3 Activity Theory

Activity theorists believe that to understand human behavior, it is necessary to give attention to the purposeful behavior of individuals (and groups) within a broader context. This purposeful behaviour occurs in relation to humans (subjects) and their motivation (an object), forming the basic unit of analysis - the 'activity' (Engeström, 1987; Kuutti, 1996). Mediating artefacts must also be considered within an "activity system", and such artefacts include tools, division of labour and community (Kuutti, 1996) or even language or specific properties of the environment (Fenwick et al., 2011). These diverse artefacts form "a history in the present", inevitably shaping practices (Fenwick et al., 2011, p. 73) and highlighting the fact that context in activity theory is seen as inseparable from the social practices that inhabit and help form it. This attention to individuals, motivations, artefacts and their framing context makes activity theory attractive to researchers looking for a way to understand the complex interrelationships between humans and technology in education.

One aspect of activity theory that is particularly relevant to this study is its focus on the role of tensions or contradictions in the ways particular systems function or change. Discussions in TEL and wider HE-related literature have repeatedly covered issues of MOOCs as change agents, or of ways MOOCs conflict with or may 'disrupt' existing systems. Activity theory emphasizes that tensions in systems help researchers to understand the nature of activity within (or between) those systems and how these tensions may be forces for innovation or change (Engeström, 1999). Indeed researchers in the field of TEL have drawn on activity theory in showing how tensions are created during the creation and implementation of online learning initiatives. Barab et al., for example, found that AT was useful to show how such tensions "emerged" during attempts to

establish an online community via a particular Web site for peer support among teachers (2004, pp. 43-4).

Exploration of tensions via AT methods can highlight how aims of initiatives, social relations, and technologies can interact shape one another in educational settings. Peruski and Mishra (2004), for example, highlight tensions in teacher experiences of online course development and use. In their study, contradictions arose over participants' divergent views of the goals of projects partly as a result of their membership of "multiple communities with different objects, tools and social relations". The concept of contradictions (between objects and tools) were also found in Czerniewicz et al. (2016, p.293), where institutional constraints were placed on permissible content in a (MOOC) course which was intended to be fully open. This was seen by some teachers as a challenge to the "intellectual integrity" of the course.

One limitation of these studies is their limited scope in terms of participants. Peruski and Mishra document the activities of just three faculty members in an institution, whilst Czerniewicz et al. focus on the creators of a single MOOC. This provides a perhaps limited insight into the processes at play. However, the studies still give an indication that a concern with tensions or constraints could be a useful element of this thesis as the focus is on the introduction of a new kind of course (and the new processes, interactions and communities this might involve) in an HE setting.

This idea of focusing on tensions and contradictions is seen to be important in STIN, and is to some extent developed further by its focus on excluded actors and undesired actions in the development and use of technologies in social contexts (Meyer, 2014). In this thesis, the STIN strategy has a particular value in terms of exploring the roles and practices of excluded or marginalized social actors in the development of MOOCs within universities. The STIN heuristics allow the researcher to investigate a network of relations similar to those outlined in ANT or AT. However, the STIN strategy also allows for consideration of a wider range of influences than the "heroes or would-be heroes" which can become the focus of ANT and AT studies (Sismodo, 2010, p.72).

Concerns have also been expressed that the 'system' focus of AT might imply not a technologically determinist perspective, but perhaps a 'technicist' one which positions "technology's inherent properties [as] contributing to but not determining the outcome of activity" (Oliver, 2011, p.378). Indeed, having used activity theory to study TEL in use, Barab et al. (2004, p. 42) conclude that it is possible to question the "ontological compartmentalization of Engeström's (1987) scheme into components such as the tool, the subject, the object and the outcome". The debate over AT's view of technology is far from settled, but as was demonstrated in section 3.2 ('MOOCs and the Web'), a Web Science approach questions approaches which position technology (particularly the

Web) as having inherent or fixed properties. Consequently, though AT has much to offer studies of this kind in terms of focus on context and tensions, the explicit concern with balancing the social and technical in the STIN strategy is deemed more appropriate for this thesis.

This section has discussed the links between STIN and the alternative approaches of SCOT, ANT, and AT to the study of technology in education. It concludes that STIN is best suited to the practical aims and Web Science foundation of the thesis, but that STIN can (and has) incorporated a number of useful concepts from these approaches into the STIN strategy. The following and final section of this chapter will consider the potential weaknesses of the STIN analytic strategy, and how the research design might take these into account.

3.3.9 Possible weaknesses of the STIN strategy: status, research skills and time

It is clear that STIN has much to contribute in studying MOOC development projects. However, it is important to recognize possible weaknesses in the approach and assess the impact of such weaknesses on the research design. This section considers STIN's status as a research tool, the demands it places on researchers, and its ability to represent change over time.

Descriptions of STIN within the research literature are at times inconsistent. Studies which discuss and evaluate STIN itself have concluded that it can be categorized as an "analytic strategy", more fully defined as a "goal oriented plan of action" (Meyer, 2006; Meyer, 2014). This contrasts with references to STIN as a framework (Barab et al., 2004), a conceptual framework (Scacchi 2005, p.2) or a "heuristic tool" (Eschenfelder and Chase 2002, p.3). The description of STIN as an analytic strategy reflects its practical orientation, and the tendency of its founder, Rob Kling, to bring together useful concepts and theory "as a sensitizing device that illuminated the problems he investigated" (Robbin 2007, p.244). Consequently, it can be argued that although STIN does not constitute either a fully formed theory or methodology, it nevertheless suffices (in the image of its creator, according to Robbin, 2007) as "theoretically informed, empirically grounded, and historically oriented" (Alford 1998, p.20).

In alignment with the interdisciplinary tendencies of STIN and SI more broadly, this study brings in social theory (of third space, and academic roles in HE) directly related to the social context under study in order to more fully appreciate how technology is embedded within that context. As previously discussed, the use of social theory in studies of technology are a feature of SI research from which STIN derives. Indeed, Kling (1999) describes how SI "tends towards moderation in balancing the ideas of social constructivism with a preference for evidence-based research that takes the technological features of socio-technical systems seriously". This point is particularly

relevant in this thesis (as discussed in the literature review section 2.7 'A gap in the research'), as simplistic conceptualizations of technology in educational research are relatively common.

A further potential limitation of the STIN strategy is that it can make considerable demands on the researcher in terms of both access to data and representation of findings. Meyer (2006, p.45) cautions that researchers need some skill in accessing research sites and information, and of obtaining information from research participants. Sawyer (2005, p.12) further warns (in relation to SI research in general) that if such access is granted, the interpretation and representation of complex socio-technical relationships constitutes a further challenge. The nature of the PhD research process, however, allows the researcher to devote considerable time, preparation and intellectual focus to the data collection process, so although certainly demanding, the demands of data collection and interpretation are not deemed to be overwhelming in this case.

Interpretation and presentation of data is also a concern of Walker and Creanor (2009, p.19) who find representing change over time an onerous task when using STIN diagrams. However, this thesis is not primarily concerned with change over time in MOOC projects, but rather to create a snapshot of the ways educator and learning designer roles are shaped as part of their interactions with MOOC technologies. The thesis explores a limited period during which MOOC production initiatives were undertaken, and participants frequently conceptualize this as a fixed (and often completed) project, rather than an ongoing narrative of change over time. The demands of access and representation related to this thesis nevertheless require reflexivity on the part of the researcher, and this will be considered in the research design (see section 4.2).

3.4 Use of theory and the research design

Having set out the theoretical basis for this thesis, it is important to clarify how this aligns with the broader research design. The design follows recommendations by Ashwin (2012) on the development of theory in educational research. Ashwin calls for use of a theoretical "internal language of description" as a "useful way of characterizing the research object" (2012, p. 943). This thesis uses SI and STIN as a way to understand the research object (technology as embedded in a network of configurable, enabling and constraining socio-technical relations). It also draws on empirically grounded concepts of Whitchurch's third space and Boyer's categories of scholarship (see sections 2.13, 2.15) as useful sensitizing concepts for the specific context of higher education. The epistemological bases of each are in suitable alignment, in terms of sharing broadly constructivist perspectives on the negotiated and contingent nature of human interactions. Indeed, SI and STIN approaches encourage the incorporation of social theories into SI analyses of technologies in organisations (Kling et al., 2003).

Empirical data collected is then used as the "external language of description" to "knock against the theory" (Ashwin, 2012, p. 944) as a way to test or refine it. This process involves the creation of a "discursive gap" between internal and external languages. This thesis attempts to explore this gap by looking at the place of technology in the third space in relation to LDs and educators. The empirical data generated by the STIN strategy can be used to "speak back to [third space] theory" (Bennett and Oliver 2011, p.185), giving a fuller socio-technical picture of the roles and practices of those involved with MOOC development. The STIN strategy, in combination with the concept of third space, are brought together to make sense of how participants work technologies into their "social practices and through doing so remake them" (Oliver 2013, p.41). Overall, it is intended that this design will produce research which links theory, empirical evidence, and social context (Alford, 1998).

3.5 Chapter summary

The theoretical framework for this study is based on the socio-technical perspective of Social Informatics, and particularly on the analytic strategy of STIN. Inherent in the SI perspective is the assumption that the technological and social are not meaningfully separable. Thus, to understand the interaction of MOOCs and educator and learning designer practices within HE an approach which balances concerns with the social and technical is required. This point of view is well aligned with the researcher's home discipline of Web Science.

Having discussed the main aims, assumptions and findings on which SI and STIN are based, the advantages of the STIN strategy for a study of this kind are outlined, whilst acknowledging the links to other related socio-technical approaches of SCOT, ANT and Activity Theory. Although each approach is recognized as contributing useful sensitising concepts for a study of MOOCs in HE, the STIN analytic strategy is identified as particularly applicable to the aim of this research project. The chapter ends with a consideration of the potential weaknesses of the STIN strategy, and how the research design has accounted for such possible weaknesses, aligning theory and research methods to produce the kind of knowledge which can appropriately address the research questions.

The methodology chapter following this one will specify in more detail how theory and method are aligned in this respect.

Chapter 4: Methodology

In any research project, it is essential to align the research aims, underlying philosophy, theory, methodology, and finally the nature of knowledge claims made as a result (Fox, 2007). This section attempts to outline the overall methodology and particular research design of this thesis in light of the research questions and relevant concepts from the literature review and theoretical framework.

This chapter begins by outlining my personal motivation to conduct this project. It then outlines the overall qualitative, interpretive paradigm within which the project is located, and the particular case study design selected for this research project. After setting out the epistemological underpinnings of the study, the chapter reports the case study research design, the criteria for selection of case study sites and participants, and the sequencing of the phases of the study. The specific research methods are then described, explaining how the particular data collection tools align with the underlying epistemology of the research. The use of thematic analysis is proposed as a means of interpreting the data, along with the particular tool used to conduct the analysis. Finally, the ethical basis on which the study was conducted is described. The overall research design uses a multi-site case study, based on interviews and documentary data. Data collection is guided by the STIN analytic strategy, and is analysed using thematic analysis as illustrated in Figure 6 below.

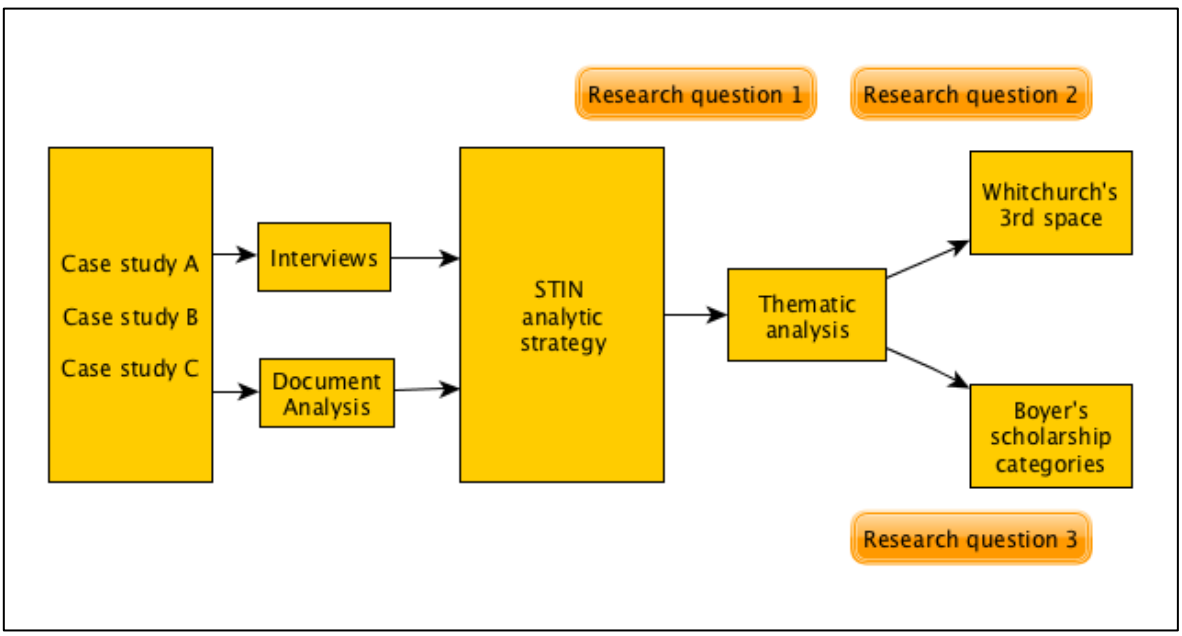

Figure 6: Overall research design

4.1 Personal motivation

My professional background working in the field of online learning was an important factor in motivating my PhD research, and in guiding my choice of research methodology and methods. In my work developing online learning materials in HE, I noticed the somewhat ambiguous 'in between' position of the role. Work duties included dealing with and undertaking academic, professional, research and administrative tasks, yet the position did not seem to be firmly located, in a practical sense, within any of these functions. I noticed that my decision-making was constrained by social, organizational, and technical factors, yet I was also able to, and sometimes had to shape or adapt my role or the uses of technologies available to me to the demands of my working context.

At times I felt I had a significant degree of 'invisible' autonomy and decision making power as a result of this 'in-betweenness'. As my research proposal and preparations developed, it was clear that an in-depth, context sensitive approach would be required. The influence of context, and the learning designers' ambiguous position within this context seemed to regularly determine the nature of the work.

4.2 The qualitative paradigm

Because of the apparent importance of context to the nature of this research problem, this qualitative study draws mainly on constructivist thinking (as part of the broader interpretivist / naturalistic paradigm), which focuses on how social experiences and meanings are created within particular situational constraints. This paradigm views reality and knowledge about this reality as socially constructed (Denzin and Lincoln, 2011), rather than claiming access to an objective reality, parts of which can be isolated and dissected. The constructivist view does not draw a sharp distinction between the detached researcher as 'knower' and participants and their context as that which is 'known' (Creswell, 2013). Rather researcher and participant create knowledge together. This allows researchers to explore the particular social context studied and draw on the disciplinary knowledge they bring with them.

This underpinning philosophy is well suited to generating understandings of multi-faceted educational contexts. According to Kirkwood and Price 2014 (p.536), an interpretivist, subjective epistemology (within which constructivism sits) is well suited to research problems where the complexity of the contexts cannot be reduced to experimental conditions. As a result, this study examines "the specific contexts in which people […] work" in order to understand participants in the settings in which they operate (Creswell, 2014). In his research into use of TEL in HE, Selwyn

(2007; 2010) has repeatedly called for "socially grounded" research where the "messy realities" of how technologies are actually used is acknowledged (2010, p.70). This epistemological perspective is particularly appropriate for research such as this thesis which draws on theoretical constructs from Social Informatics, showing how technologies are embedded and configured in particular contexts (as discussed in section 3.3.5).

4.2.1 Linking theory and methodology

In terms of theory, this study attempts to build on the theoretical understandings generated in Social Informatics as mentioned above, using prior research and theory as an "orienting framework" (Bennett and Oliver, 2011, p. 185) to help inform the conceptual underpinnings and research design of my study. This previous research will not be treated as a set of constraining rules, however, but provide a framing perspective from which to create a pragmatic research design suited to the particular research problem. Such a framing perspective is intended to help highlight the theoretical assumptions in my methodology, such as the constructivist epistemological principles mentioned on the previous page and align them with the requirements of the research problem and associated investigative strategy (Silverman, 2013). The constructivist viewpoint is an important element of studies in Social Informatics. As discussed in section 3.3.1, in many ways SI parallels the Web Science perspective of a co-constructed relationship between social and technical factors where ICTs (in this case the Web) are brought into particular social contexts. A concern with these particulars of context is also suited to the inductive approach commonly used in qualitative studies (for example in Grounded Theory), where theory building moves from the specific to more generalized understandings of phenomena. Once more generalized understandings of a case are generated, these can be used to "position cases as part of wider body" of theoretical work (Bennett and Oliver, 2011, p.185).

This approach also responds to an identified need in the field of MOOC research for more qualitative approaches to understanding MOOCs. An influential literature review of early research into MOOCs by Liyanagunawardena et al. made this observation in 2013. Subsequently, a bibliometric analysis of MOOC literature by Veletsianos and Shepherdson (2015) finds that quantitative, even positivist approaches are dominant, and in a subsequent literature review call for use of qualitative approaches to add depth to our understandings of MOOCs (Veletsianos and Shepherdson, 2016). Some balance to this can be found in Bozkurt et al. (2016), however, who find more qualitative work on MOOCs amongst Masters or PhD dissertations.

Although qualitative research clearly has potential to contribute to understandings of MOOCs and those who work with them, researchers are urged to take a reflexive approach. The researcher's

influence on and relationship with the objects and context of study are acknowledged in this paradigm, so the focus becomes that of observing processes of the creation and understanding of social experience. Consequently, reflexivity on the part of the researcher is required (Simons, 2009), which involves development of self-awareness about one's own values, assumptions, or possible biases (Creswell, 2013). Thinking reflexively in this sense is crucial in interpretivist research because of the multiple levels of interpretation at play where participants and researchers in turn create, interpret and assign meanings to social experience. In this research, extensive use of field notes and memos reflecting on my thinking during data collection and analysis were kept and periodically reviewed and compared against the original data generated. In doing so, I hoped to gain a fresh perspective on both the research sites and participants, and my own thinking. These reflective notes were an important aid to my thinking about the research and my position within it, but were kept and treated separately from the original data collected from participants.

4.2.2 Selecting methods suited to a socio-technical perspective

The methodology has been chosen, therefore, to develop understandings of the multiple and negotiated meanings and interactions which characterise a socio-technical perspective on technology in education. This constructivist viewpoint in qualitative research is common in studies looking at the role of technology within particular social contexts, such as work by SCOT researchers (see section 3.4.8.1). However, it should be noted that the STIN approach also makes use of "evidence-based research that is also at least somewhat positivist" (Meyer, 2007:78). It does this by balancing social concerns with a focus on architectural choice points in a system, but also the range of configurations of technologies which influence these choices. Whilst it resists technological determinism (see section 2.8), STIN also rejects wholly social determinist perspectives, recognising that some aspects of technological artefacts are not socially shaped (Kling, 1992). The STIN strategy allows researchers to include "concise descriptions of technologies used in certain contexts", and acknowledge that such technologies have a role in "enabling people to configure their relationships" rather than causing particular effects (Meyer, 2014, p.3). This methodological feature is particularly appropriate for a Web Science perspective, which is interested in processes of social and technical co-construction.

4.3 Research design

4.3.1 Using a case study approach

A range of research designs were considered for this project, but in light of the particular research questions (set out in section 1.3) which investigate how MOOCs are embedded within a broad and complex educational context (Stake, 2008), a case study approach was selected. This approach gives due attention to the importance of context in human affairs, where universals and formal predictive theories are rarely applicable (Flyvbjerg, 2006).

Although a range of definitions of case studies are available in the methodological literature, Simons (2009, p.21) identifies common elements among them in that they (a) attempt to study a situation/phenomenon in a 'real life' context, (b) attempt to understand complexity and (c) are not defined by specific methods. Yin's explanation of the focus of case studies also supports this understanding of this research strategy in linking use of cases to empirical inquiry into complex situations where "the boundaries between the phenomenon and context are not clearly evident" (Yin 2003, p.13). As such they are a particularly attractive research method in socio-technical studies concerned with co-construction of social practices and technological artefacts. Indeed, case study methods are often used in education and TEL research (Bennett and Oliver, 2011), and much work in the field of Social Informatics studies is also "grounded in case studies" (Sanfillippo and Fichman, 2013, p.2).

This use of case studies as a grounding for a discipline is one highlighted by Kuhn (1987; cited in Flyvbjerg, 2006, p.242) who argues against criticisms of case study methods:

> a discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars, and that a discipline without exemplars is an ineffective one.

However, a number of concerns with the validity or reliability of data and interpretations used in case studies certainly do exist (Flyvbjerg, 2006). These concerns can be addressed in attending to certain criteria or processes related to conducting high quality qualitative research, including the open, clear and comprehensive presentation of methods, findings and interpretations (Silverman, 2013) (to be discussed in section 4.6 'Evaluating research quality). In order to be consistent with the underpinning epistemology of the research, these criteria should align with constructivist thinking rather than more positivist notions of researcher detachment, and value-free research. Although time-consuming, the use of a multi-site case study can produce "robust and reliable evidence" (Baxter and Jack 2008, p.550) provided quality criteria are considered.

4.3.2 Using an instrumental, theory-led case study approach

There are various types of case study within this overall understanding of the methodology. Rather than focusing on building a detailed understanding of a single case (as in intrinsic case studies), this case is broadly instrumental and theory-led in that it explores a set of cases "through a particular theoretical perspective" (Simons, 2009, p.21) of third space activity in HE, illuminated by the analytic strategy of STIN. This is intended to provide opportunities to refine the (third space) theory, particularly by bringing a socio-technical element to it. This approach is consistent with Bennett and Oliver's recommendations on bringing theory into TEL research. They outline an exemplar of this where theory was used:

> to structure the study; theory provided an orientating framework to shape data collection and analysis by providing a lens that determines which aspects of the context should be attended to and why they are important to understanding the phenomenon.
>
> **(Bennett and Oliver, 2011, p.185)**

In the same study, Bennett and Oliver (2011, p.186) state that this use of theory can help to delineate the scope of a study, select credible evidence, and assist in management and interpretation of data. The interpretation process allows a researcher to check the extent to which the theory predicts the phenomena under study, but also refine the theory in allowing "the empirical to 'speak' back to theory", perhaps by bringing "previously unconnected theories together" (2011, p.185). This relationship between case study research and theory is also highlighted by Stake (1995), who contends that "naturalistic generalizations" can be made from cases which "generalize a particular set of results to some broader theory" (Yin 2009, p.43). As a result, this study can be framed within the broader context of 'third space activity' and MOOC use with the methodology designed to address this particular concern. This allows for an approach which is driven by the particular problem or concern at hand, rather than dictated by the methodology itself (Flyvbjerg, 2006).

4.3.3 A multi-site case study

The "bounded context" of MOOC use in the selected universities represents the "unit of analysis" for this multi-site study, in an attempt to reveal commonalities or differences between sub-cases (Miles and Huberman 1994, p.25). Such multi-site studies can be conducted to refine theoretical predictions of similarities or differences between research sites, and reasons for predicted differences between sites. This research aims to identify the complex social interactions and technical configurations which characterise MOOCs in their institutional contexts, in order to

develop a reliable understanding of their "design, use, configuration, and/or consequences" (Kling, 2000, p. 228). From the application of a STIN framework, this deeper understanding of the data collected from the sites will be examined in order to "develop analytic generalizations" appropriate to the findings (Yin, 2003). This approach allows the use of a range of sources of data (Yin, 2003) and seems suited to this study as it "supports the deconstruction and subsequent reconstruction of various phenomena" (Baxter and Jack, 2008, p. 544) in line with STIN modelling practices.

4.3.4 Phases of the study

After the initial literature review which identified a gap in the research, the study progressed through five main phases.

Phase one: An initial preparatory phase involved a desk study of the various MOOC initiatives ongoing in the UK higher education context, and exploratory interviews with experts in the field of MOOCs and online learning (n=6) (see Table 5). These experts were identified through discussions with my supervisors and academics working in the field, and verified by research into relevant publications and the experience of those experts.

From these discussions, a number of possible research sites were identified and narrowed down to three core sites using the processes discussed in section 4.3.5. Before I carried out my first phase two interviews, I piloted my semi-structured interview guides with individuals involved with MOOC development and production at my host university, providing me with opportunities to adapt my interview prompts.

Expert interview	Date	In person	Telephone	Length
1	Sept 2015	□		45 mins
2	Oct 2015		□	30 mins
3	Oct 2015		□	40 mins
4	Nov 2015	□		45 mins
5	Nov 2015	□		30 mins
6	Dec 2015		□	35 mins

Table 5: Number, date and form of exploratory expert interviews

Phase two: University B (Jan - March 2016)

During phase two, relevant documentation was collected and analysed in order to develop an institutional perspective on MOOC development and implementation procedures at UB. Through document analysis, further potential key participants at each site were identified, and preliminary qualitative thematic analysis was undertaken. Concurrently with document analysis, semi-structured interviews were carried out with key stakeholders involved in MOOC development, following the STIN analytic strategy, including the recording of observational field notes relating to the site and participants. After transcribing the interviews, I conducted an initial thematic analysis of interview and documentary data, first using the STIN strategy as a guide to coding, and then developing some tentative categories of my own as underlying themes emerged.

Phase three: University A (June - September 2016)

Phase three involved the same processes as phase two (with the exception of the interview guide piloting), and allowed checking, adaptation and development of my coding scheme.

Phase four: University C (December 2016 - February 2017).

Phase four applied the same procedure as phases two and three, and involved further checking and comparison of coding procedures (for reliability), and the development of codes and underlying themes as my understanding of the data developed.

Phase five: Analysis and interpretation of the quintain (September 2017- March 2018)

Having completed the primary data collection phases of the multi-site case study, I continued the comparative analysis and interpretation of data across the research sites.

4.3.5 Site and participant selection

This research project consists of a multi-site case study of the "bounded context" of MOOC use in three UK universities, so the selection of sites formed an important step in the research process. In choosing a 'quintain' - a set of sites which represent "the whole, the entity" or the "umbrella for the cases we will study", Stake (2013, p.23) advises that cases should be relevant and rich in information, yet also provide "diversity across contexts". As a result, the sites selected need to balance similarities and differences whilst retaining a focus which "binds" the cases (Stake, 2013, p. 23) - the socio-technical construction of MOOCs in this research. In such a way, the construction of MOOCs can be explored in different institutional contexts.

At the outset of the study (2014/5), the number of UK institutions developing MOOCs was relatively limited at fewer than 30 (McIntyre, 2016), so attempting to extract a representative random sample of institutions was not feasible. In these cases, purposive sampling can be used as

an alternative, especially where the aim is to "help people and organizations function better" (Stake, 2013, p.24). The use of this purposive sampling technique entails some limitations, for example that generalizing from a limited sample to an entire population is difficult when using this method. However, as mentioned above, this case study is more focused on generating the most relevant data possible in order to find patterns and refine theory rather than to claim wider generalizability. For this reason, the identification of research sites leveraged this purposive technique, particularly snowball or chain sampling, in which key informants identify further potential "information rich cases in the field" (Suri, 2011, p. 69). Chain sampling was used to identify potential research sites and key contacts at each site in the first preliminary phase of the research, and as the project progressed through phases two to four. As expected, a range of possible research sites and key participants were mentioned in these discussion, but following the recommendations of Patton (2002, p. 237) it was possible to identify a smaller number of targets which were repeatedly suggested across the exploratory interviews in phase one of the research.

University	Size of student body	Use of common platform provider	Number of MOOCs produced	MOOCs in science, business, and language/literature	Russell group	Access to institution for research / participants
UA	15-20,000	Y	15+	Y	N	Y
UB	20-25,000	Y	10-15	Y	Y	Y
UC	25-30,000	Y	5-10	Y	Y	Y
UD	15-20,000	Y	10-15	Y	N	N
UE	25-30,000	Y	15+	N	Y	N
UF	20-25,000	Y	5-10	N	Y	Y

Table 6: Selection of case study sites. Figures for 2016 (HESA, 2017)

Table 6 shows the key institutions identified through my preliminary desk study and expert interviews. In order to maintain a fundamental base line of comparability across the sites selected, only UK institutions using the same platform provider were selected. Furthermore, institutions producing MOOCs in comparable disciplinary areas (science, business, and language/literature) were also chosen. This responds to findings by Bayne and Ross (2014) on the link between MOOC pedagogy and disciplinary norms, and those of Fry (2004) noting the

connection between scholarly disciplines and ICT use more generally. Such comparability of sites allows the embedding of the same technology within different institutional and social contexts to be explored.

However, research sites were chosen which were otherwise dissimilar in terms of their overall size (numbers of students), and the number of MOOCs produced. Each was identified by the experts as having a potentially distinct approach to MOOC production and implementation. Of the six institutions, four displayed this mix of comparable and distinctive features (see Table 5 above). One institution (UD), was unable to grant formal access to the institution/participants for research purposes, so the quintain of UA, UB, and UC was selected. This quintain is intended to fulfil Stake's criteria of providing relevance, diversity and chances to understand complexity in context (Stake, 2013, p. 23).

4.3.6 Site visits and participant sampling

Research trips were organized via telephone and email either via a single, central contact (UA), or via contact details of each individual involved (UB, UC). In all cases, further participants were identified through chain sampling during interviews, and cross referenced with data collected to ensure that key names arose repeatedly in the data (Patton, 2002). This helped to ensure that participants in the study were seen as significant and relevant not only by particular institutional gatekeepers, but also those involved directly and indirectly with MOOC production and implementation.

As part of the STIN analytic strategy, a number of different types of participants were identified in the network of social actors involved with MOOCs. This meant that the sample of interview participants included those in management, learning design and educator roles, and also took account of (through either interviews or document analysis) those in roles perceived as more peripheral to MOOC ventures. This was in part an affordance of the STIN approach, which helps to account for more seemingly peripheral or 'excluded' social actors where technologies are introduced into particular social contexts (Meyer, 2014). In addition, the gender mix of participants was almost equally balanced (50/50 male/female at UA and UB, 60/40 male/female at UC).

4.3.7 Site descriptions: UA, UB and UC

The following section gives a brief outline of the chosen research settings in terms of size, positioning within UK HE, and relationship to online learning. As shown in Table 6 all the universities produce MOOCs in the fields of science, business and language/literature (amongst

other subjects covered), with the same MOOC platform provider. As explained in section 4.3.4, background research on these institutions established that they may have distinct approaches to MOOC development and implementation. This was a major factor in site selection and forms a basis for comparison across the quintain in allowing a focus on the work of LDs and educators.

University A (UA)

University A is a small-mid size university, within the 15-20,000 student category. Although not a member of the Russell group, it is a well-established university, ranking in the top 30 UK universities across a number of ranking agencies UA produces a range of MOOCs, and had the highest total of MOOCs running with the shared platform provider in 2015-2017.

Uni A does not have a major focus on credit-bearing online courses, instead running a small number of online units as part of wider courses. Although some technical staff / media producers may have had contributory roles in both credit bearing online courses and MOOCs, most of those involved with developing these units are not directly linked with MOOC development projects. The MOOC team at UA was created as a separate project (with MOOC LDs recruited externally). Like many other universities it has internal online skills-focused courses for training students and continuing professional development of staff.

University B (UB)

University B is a mid-sized university (20-25,000-student category). A member of the Russell group, it has a comparable ranking to UA (within the top 30 UK universities) and produced between 10 and 15 MOOCs with the common platform provider during the 2015-2017 scope of this research project, but has also worked on other comparable projects during that period. It has a small number of accredited online courses, but provision for these courses was not part of a broader, top-down institutional strategy or course production and development programme. Conventional (non-MOOC) courses are located within and developed by individuals or groups within a few distinct areas, with limited input from LDs involved in the more centralized MOOC production initiatives.

University C (UC)

University C is a larger mid-sized university (25-30,000 -student category). It is also a member of the Russell group, with a comparable top 30 UK universities ranking to UA and UB. It produced fewer MOOCs with the common platform provider during the scope of this research project, but has also worked on other comparable projects within that period. In contrast to UA and UB, UC has developed a strategy aimed at developing online courses and running a range of credit-

bearing online courses, and participants claim that the institution has experimented with MOOCs to establish what roles they might play in association with that strategy.

As with the other two sites, access to and information about MOOCs run at UC can be found on both the platform provider website and via the university's own web pages.

4.4 Methods

The research design employs primarily qualitative methods as outlined in Creswell (2014), using semi-structured interviews concurrently with document analysis. These methods may not have the depth of a full online/virtual ethnography of individual participants (Hine 2000; Hine 2008), but provide an important means to understand the interaction networks of participants. The aim of using two methods of data generation is to add both depth and "data credibility" to the research as a means of methodological triangulation (Baxter and Jack, 2008), as will be discussed further in section 4.6 on evaluating research quality.

The semi-structured interviews and document analysis procedures described in this section were used to address the STIN heuristics set out in section 3.4.6.

4.4.1 Interviews: co-creating 'thick descriptions' of situated activity

Semi-structured interviews are used in this study to help understand the complex educational context of HE and the MOOC technologies which become embedded in this context. Interviews can help generate "thick descriptions" (Denzin and Lincoln, 2011) of the cases, and are used as part of a broader qualitative interpretative approach to explore the "often compromised and constrained realities of educational technology use 'on the ground'" (Selwyn, 2010, p.65) in HE. Semi-structured interviews can be used, therefore, to understand social situated activity (Kvale and Brinkmann 2009, p.173) in line with the social constructivist underpinnings of the study.

However, researchers need to be aware of the affordances and limitations of interviews as a data collection tool, and to ensure that collection and treatment of data aligns with the philosophy, aims and research questions of the study (Silverman, 2013). On a fundamental level, this research design views the interviewer as constructing or co-creating knowledge with participants, rather than using the positivist view of a detached or 'neutral' observer (Creswell, 2013). Interviews can produce 'thick' data, but accounts should not be viewed as a "fixed text" (Holstein and Gubrium, 1995, p. 28). Participant accounts are often seen as "emic" or 'insider' accounts of activity to be interpreted cautiously as such. Indeed a key aim of Social Informatics studies is to gain a deeper

understanding of the role of technologies in social contexts, questioning assumptions by both commentators and users about the nature and use of technologies in society (Meyer, 2014).

The researcher's orientation toward participants can influence the accounts of phenomena they produce. Levy and Hollan (2014) argue for a perspective which sees research participants as both informants and respondents. Informant-oriented questions tend toward more official or institutional perspectives on events (an example question being: "Could you describe the process of MOOC development at your organization?"). In contrast, treating a participant as respondent focuses on the personal, social reality and can produce quite different accounts ("How did you learn how to create MOOCs?"). This approach to interviewing helps to create a view of phenomena which is both embedded within the institutional culture, but also allows for Selwyn's "messy realities" of technology use (2010, p. 70).

4.4.2 Interview questions

The interview questions (see Appendix A) were developed with the concerns of aligning epistemology, research aims and research questions in mind. Questions were informed by the socio-technical perspective of the study, drawing on theoretical understandings of technology in social contexts as a way to establish a relevant focus. However, the interview schedule was also "progressively focused" as analysis and interpretation of interview (and documentary) data progressed to allow for a feedback loop into the research methods as an understanding of the "organizing concepts" for the project developed (Stake, 2008, p.vi). This was done in the context of maintaining a closeness to the data generated, but also using reflective field to notes to foster reflexivity about any preconceptions and perspectives that the researcher inevitably brings to the study (Creswell, 2013). The interview schedule was initially informed by discussions with academics at MOOC-related conferences, and preliminary interviews with experts in the field of online and distance learning in various UK HE institutions (n=6). However, the schedule also draws strongly on the STIN analytic strategy as an established means of drawing out a socio-technical understanding of phenomena. Table 7 summarises the data collection activities conducted during the study:

Research site	Number of participant interviews	In-person interview	Phone Interview	Documents analysed	Participant role		
					Educators	LDs	Mgmt/prof
UA	10	8	2	10 (25pp)	7	2	1

UB	14	12	2	14 (47pp)	6	5	3
UC	10	6	4	15 (23pp)	6	2	2
Totals	34	26	8	39 (95pp)	18	9	7

Table 7: Data collection activities across the sites

Interviews were between 30 and 60 minutes in duration (see Table 8), and all interviews were recorded on a digital device, uploaded to the research database on a secure laptop computer, and backed up in a password-protected file on an external hard drive. The total number and length of interviews was longer at UB than at UA or UC as they had more LDs involved with MOOCs than the other case locations. Interviews were subsequently transcribed by the researcher using a simple annotation method (as linguistic analysis was not the focus of this research method). The majority (26) of the interviews were conducted face-to-face at the research sites, with a smaller number (8) conducted via telephone (but also recorded in the same manner as the in-person meetings). As part of a wider log book documenting evidence, decisions, and progress in the study, details and reflective notes on each interview were made on the same day of the interview (Gillham, 2010), and also saved (as secondary data) in the research database.

University	Number of interviews	Length of interviews (mins)	Transcriptions (pages)	Transcriptions (words)
UA	10	409	140	60,000
UB	14	735	207	101,200
UC	10	401	108	52,300

Table 8: Total numbers and length in minutes, pages and words of interviews at each case study location

As discussed above, gaining a nuanced understanding of participants in their relevant social contexts is important. However, taking a step back toward an 'etic' perspective which values external knowledge from relevant academic fields adds depth and rigor to accounts. Indeed, Silverman cautions that there is often a gap between what research participants believe or say they do, and how they actually behave in reality. This means that any conception of 'reality' in a particular context is simply a momentary snapshot or perspective rather than something more stable and enduring (Silverman, 2013, p. 239). For this reason, the following section will explain how document analysis is also used in the research to provide another perspective on the research context, and to check or confirm significant meanings or interpretations.

4.4.3 Document analysis

As part of the case study approach, the research design includes document analysis, which is a systematic "process of evaluating documents in such a way that empirical knowledge is produced and understanding is developed" (Bowen, 2009, p.34). As noted by Weber (1978, cited in Prior 2003), "the modern world is made through writing and documentation", and this particularly applies to institutions like universities, the fundamental nature of which in many ways "is in its documents rather than its buildings" (Prior, 2003). According to Owen (2014), document analysis can give background information to studies, corroborate or refute observations, and challenge versions of events. In this way, the research design uses document analysis to help avoid one-dimensional or "impressionistic" accounts (Silverman, 2013, p.241) which can be generated by interviews, helping to give a fuller picture of what actually occurs in the contexts studied.

As such, documents, which can be considered "social facts" in that they are situated, collective products (Atkinson and Coffey, 1997) can be used in various ways, but are primarily useful for "methodological and data triangulation" and are recognised to be of "immense value" in case studies (Bowen, 2009:29). In addition to complementing a case study approach more generally, the technique of thematic analysis applied to interview data in this study is also well-suited to document analysis (Bowen, 2009). In this study, a range of document formats are used, including more conventional Word or PDF documents and more flexible online records (such as Web pages and wikis).

Although there are many advantages of documentary analysis (relatively low cost, efficiency, unobtrusiveness), problems may arise in barriers to access, or documents containing insufficient detail (Bowen, 2009). However, in this study, most participants were prepared to provide access to a range of documentation related to MOOC development and implementation processes, and more than 39 documents were obtained relating to the research sites (95 pages in total, see Table 8). A further possible limitation is that the participants and researchers determine the selection of documents, so may be biased in this choice.

However, this concern can be addressed to some extent through reflexivity on the part of the researcher in recognising that documents are socially produced, and therefore the nature and aims behind the production of such documents should always be taken into account (Bowen, 2009; Owen, 2014). This means that documents, much like interview transcripts, "should not be treated as necessarily precise, accurate or complete recordings of events" (Bowen, 2009:33), though analysis of them may suggest further sites of research which in turn help to corroborate and add credibility to findings (Owen, 2014). As a result, with sufficient critical analysis of

documents and reflexivity on the part of the researcher, documentary analysis can add valuable depth and breadth to qualitative research, including case studies (Yin, 2009).

The types of documents used in the study are as follows:

- Course proposals and applications
- Training guides and information
- Planning documents and procedural guides
- Participant information
- Marketing reports
- Legal documentation and agreements
- Websites (blogs, wikis, course descriptions, web pages and guidance documents from the platform provider)

Documents were collected, added to the research database, and coded alongside interview transcripts (see Table 6 above, section 4.4.2). As with interviews, reflective field notes were made during the collection and analysis of documents. This provides a record of the evidence collected, the researcher's reactions to them and decision-making in relation to them.

4.4.4 Changes to data collection methods

The original research plan included participant observation as an element in the data collection. However, it became apparent that the type and duration of access to research participants at the research sites was severely constrained and may not yield rich or authentic data relevant to the case. For this reason, participant observation was ultimately excluded from the research design at an early stage. Although this meant the loss of a potentially useful perspective on activity at the research sites, the new design gave enabled more time to be spent on in-depth analysis of interview and documentary data. The rationale and method for data analysis is set out in the following section.

4.5 Data analysis

4.5.1 Distinguishing Qualitative Content Analysis and Thematic Analysis

As with other choices in the research design, the approach to data analysis needs to be consistent with the aims and methodology of the study, and the underlying perspective on the nature of reality and knowledge produced during enquiry. Interviews and document analysis can generate large quantities of data, so the method of analysing this data is significant. In qualitative studies,

Qualitative Content Analysis (QCA) and Thematic Analysis (TA) are frequently used to describe and interpret data of this kind, but are sometimes confused and conflated (Sandelowski and Leeman, 2012). As a result, this section will briefly distinguish the two approaches, and explain how the chosen approach of TA is suited to this study.

Although both QCA and TA are focused on analysing and breaking down texts into smaller units, QCA retains a quantitative element of counting particular codes or categories (Gbrich, 2007). TA on the other hand, focuses in producing more rich, nuanced and more purely qualitative interpretations of data (Braun and Clarke, 2006). In this way QCA has the advantage of quantifying the frequency of particular codes or categories, but has the potential drawback of attaching significance to particular codes without attending to the particular contexts in which they occur (Vaismoradi et al., 2013). A particular term or category can occur frequently in data for a number of reasons, not solely because it is significant to the case. As this research project utilizes a Social Informatics perspective which emphasizes the importance of technology use in context, the specific contexts of MOOC development and use are particularly important. As a result, TA was selected as the most appropriate means of data analysis.

4.5.2 Thematic analysis

As part of the case study approach, thematic analysis is well-suited to analysing complex data and producing in-depth accounts of them (Braun and Clarke, 2006). The aim of the thematic analysis (TA) is to identify themes or common threads underlying representations of phenomena and produce “a coherent integration of the disparate pieces of data that constitute the findings” (Sandelowski and Leemans, 2012). Although situated within a constructionist paradigm, the TA technique relies on a ‘factist’ perspective which “assumes data to be more or less accurate and truthful indexes of the reality ‘out there’” (Sandelowski, 2010). As a result, TA is often used to investigate actual behaviour or motivations of individuals, or to establish what has occurred in a particular context (Ten Have, 2004) and is therefore well suited to the current study of educational practices and MOOCs. This could result, however, in challenges to the validity of interpretations of the data collected, so triangulation of methods and the maintenance of a reflective and critical researcher perspective are also important elements of the research design (see section 4.6 below). For example, the addition of documentary analysis is (as discussed in section 4.43 above) used as a way to corroborate participant accounts and produce a fuller perspective of the contexts under study.

Both inductive and deductive approaches to TA can be undertaken, the choice between them largely depending on the aim of research and the state of knowledge in the field in relation to the

particular topic (Vaismoradi, Turunen, and Bondas, 2013). In this research project, some pre-defined categories are brought to bear by the STIN analytic strategy, providing some deductive framing of research questions. However, it is expected that further categories will emerge from analysis of the data itself, and this adaptation of an initial framework (STIN in this case) is acceptable in qualitative research (Sandelowski, 2010), where generalisations are often derived from an in-depth exploration of particulars of the data (Creswell, 2007). Indeed, during the process of data analysis in this study, the idea of LDs operating in a space 'between' academic and professional roles quickly emerged, and the concept of Third Space was identified as a possible theoretical lens to aid interpretation and understanding of the cases. This allows the methods and "organizing concepts" used in case studies to be "progressively focused" in line with Stake's recommendations on conducting multi-site case studies (2013).

The analysis of data follows a six-step process as set out by Vaismoradi et al. (2013):

1. Familiarise with data (transcribe, read, re-read)
2. Generate initial codes (code systematically across data set)
3. Search for themes (collate codes to themes)
4. Review themes (check if themes work, generate thematic map)
5. Define and name themes (refine, name and generate overall story of analysis)
6. Report

This process aligns with data analysis procedures recommended for case study research as set out by Simons (2009), in which data is broken down into segments or categories in an attempt to discover patterns or connections. Data generated (interview transcripts and documents) were coded according to the above procedure and analysed using NVivo 11 Software. The software falls under the umbrella term Computer Assisted Qualitative Data Analysis (CAQDAS), and affords opportunities to conduct complex coding and querying operations on qualitative data. Secondary data such as field notes and reflective notes were also coded, though kept separate from the first order data.

Coding categories in the STIN approach can be derived in two ways, following Meyer (2007). First, codes are generated from the research questions. Second, themes which are identified in the data as a result of inductive analysis are incorporated into existing schema in line with ideas from grounded theory (Corbin and Strauss, 2008). This approach is common in Social Informatics, where knowledge derived inductively is combined with "socio-technical knowledge of a research

domain", bringing together existing concepts from STIN as informed by social theory, but also remaining open to the emergence of "new, unexpected socio-technical behaviors and relationships emerging from the data collected for the research" (Meyer, 2007, p.79).

As this is a multi-site case study research design, analysis and comparisons across the cases are important. However, each case was analysed separately in the first instance, following procedures set out by (Stake, 2008). Stake advises seeing each case as part of a whole (the quintain), but that they should not be merged too quickly so that each particular situated context can be fully understood in its own right. The case study process should involve a "case quintain dialectic" which follows an "adversarial, rhetorical procedure, wherein attention to the local situations and attention to the program or phenomenon as a whole contend with each other for emphasis" (2008, p.47). Using this approach, I was able to consider the Socio-Technical Interaction Networks in place at each location, then compare the overall depictions or particular elements across cases. This allowed me to gain a greater understanding of commonalities and differences across the research locations.

4.6 Evaluating research quality

4.6.1 The nature of validity in qualitative research

In considering the quality of scientific research, the notions of validity and reliability are often invoked. The former refers to the extent to which research represents the phenomena under study, whilst the latter is concerned with the consistency and precision of measurements over time (Hammersley, 1997). However, these notions are more closely aligned with positivist research paradigm which claims access to an objective reality, rather than the constructivist perspective on which this study is primarily based (Kvale, 1995). Indeed, many criticisms of case study research are drawn from a positivist perspective which fails to accurately account for the nature of context dependent knowledge which cases investigate (Flyvbjerg, 2006). Representing a neutral or objective representation of reality is seen as problematic in this perspective, so researchers need to focus instead on ways by which the credibility of their research can be enhanced in that research reflects the situations, authentic experiences, timelines and meanings of participants in the study (Stake, 2009). To achieve this, Silverman (2005) suggests that researchers focus on building useful theory, choosing appropriate research methods and being self critical as a foundation for quality research. He also warns against basing theories on a few "well-chosen examples" ('anecodatlism') or relying on a "common-sense gloss" to generate categories or codes directly from participant accounts. Across the methodological literature

aligning research aims, questions and methodology is seen as a foundation for quality research (Creswell, 2013; Silverman, 2005; Denzin and Lincoln, 2005).

4.6.2 Methodological triangulation

In addition to these overall principles for quality in qualitative research, the practice of methodological triangulation is used to improve the quality of this case study research. Triangulation is defined as "the combination of methodologies in the study of the same phenomenon" (Denzin 1970, p.291) and is used in case studies to obtain the perspectives of different actors which are meaningful, replicable and clear (Stake, 1995). The focus of triangulation can be both within and across cases in a multi-site study, and is used in this study as process of repetition and review to find multiple (three or more) "confirmations and assurances that key meanings are not being overlooked" (Stake, 2013, p.33). The practice of obtaining feedback from participants on the researcher's interpretations, known as member checking (Denzin and Lincoln, 2005), can also be used as a way to strengthen a researcher's claim to validity or credibility in their research. However, Silverman (2005) cautions against an over-reliance on triangulation as it can imply a positivist perspective on the nature of reality, and this is not compatible with the qualitative, constructivist philosophy outlined above. As a result, this research project attempts to maintain quality by combining use of multiple sites and sources of evidence, a clearly documented research processes and a reflective, critical approach which keeps in mind the philosophical perspective and methodological strengths and weaknesses of the research design. The research also maintains a clear focus on ethical practice in research as outlined in the following section.

4.6.3 Ethics

The study was subject to full scrutiny under the University of Southampton ethics procedure and received formal approval under the reference ERGO/FPSE/17725. In line with the University ethics policy, I worked to conduct research which would "do positive good and avoid causing harm" (University of Southampton n.d.). At the request of my upgrade examiner, I further consolidated the ethical basis for my study by gaining formal written ethics approval from ethics gatekeepers at each of the participant institutions (included in anonymised form in Appendix D). In line with the procedures outlined in my ethics approval documentation, the participants and institutions involved in the study have not been identified in order to maintain confidentiality. From the outset of the study, I ensured that participants understood the aims and intended outcomes of my research, provided full informed consent, and were given the opportunity to review the

transcripts of interviews. Only the researcher has viewed the full set of interview transcripts, and some sections were in any case redacted where participants requested this.

Ethical standards were observed in plans for the collection, handling, dissemination and destruction of information collected for and used in the study. Participants were informed that all transcripts and documentation are stored on a secure, password protected computer. After completion of the research project, all data will be encrypted before being destroyed using one of the well-known file deletion information security standards. Participants were also informed about how the research would be disseminated. This follows guidance on ethical research when using online and offline sources of information (Eynon et al., 2008), and for case studies more generally (Simons, 2009).

4.7 Chapter summary

This study aims to investigate the socio-technical construction of MOOCs in HE, with a particular focus on educator and learning designer roles and practices. This section has argued that a qualitative, interpretivist paradigm is best suited to achieving the aims of the project in generating an in-depth, situated account of phenomena. This aligns well with the theoretical principles of Social Informatics which consider the social and technological as inseparable and embedded in their social context. The approach also responds to an identified gap in the literature for qualitative studies of MOOCs.

In line with established approaches in Social Informatics, a case study research design is adopted, and the specific multi-site case study approach, using triangulated, multiple data collection methods on a purposive sample have been described and justified. The section then outlines the use of thematic analysis to generate in-depth, situated understandings of complex data across the case sites. The final section describes the ethical foundations of the study, and highlights the ways in which the quality and credibility of the research is maintained through alignment of aims, questions and methods, thoroughness of approach and researcher reflexivity.

Chapter 5: Findings 1: STIN analysis and LDs as hubs

This section reports on the findings of research question one:

What are the socio-technical systems related to MOOC development in which learning designers and educators are involved?

To do this, it answers the following inter-related sub-questions in turn:

a) What is the relevant population of system interactors and groups involved in developing and using MOOCs?
b) What are the incentives, pressures and impediments related to development and use of MOOCs?
c) Which actors are involved for the first time, which actors are excluded and which actions become undesirable in relation to MOOC development and use?
d) How do educators and learning designers learn about MOOCs and the gain skills needed to develop them?
e) What are the resource flows in relation to MOOC development and use?
f) What are the architectural choice points in MOOC development and use?
g) How do the architectural choice points map to the socio-technical characteristics of the system?

Answers to these questions, drawing on evidence and examples from the analysis of interview and documentary data will generate an understanding of MOOC production as a socio-technical arrangement within the wider context of the case universities. Participant codes are used to link participants utterances with their institution and role (for example, utterances by the first of 8 educators from University A is marked [UA_ED_01]), a full list of which is provided in Appendix B. The answers to each question give an overview of MOOC development across the institutions, but also highlight any important distinctions between the socio-technical arrangements at each institution. Before looking in depth at these questions, the following page gives a general overview of the common features of MOOC development process at the case locations, as illustrated in Figure 7 below.

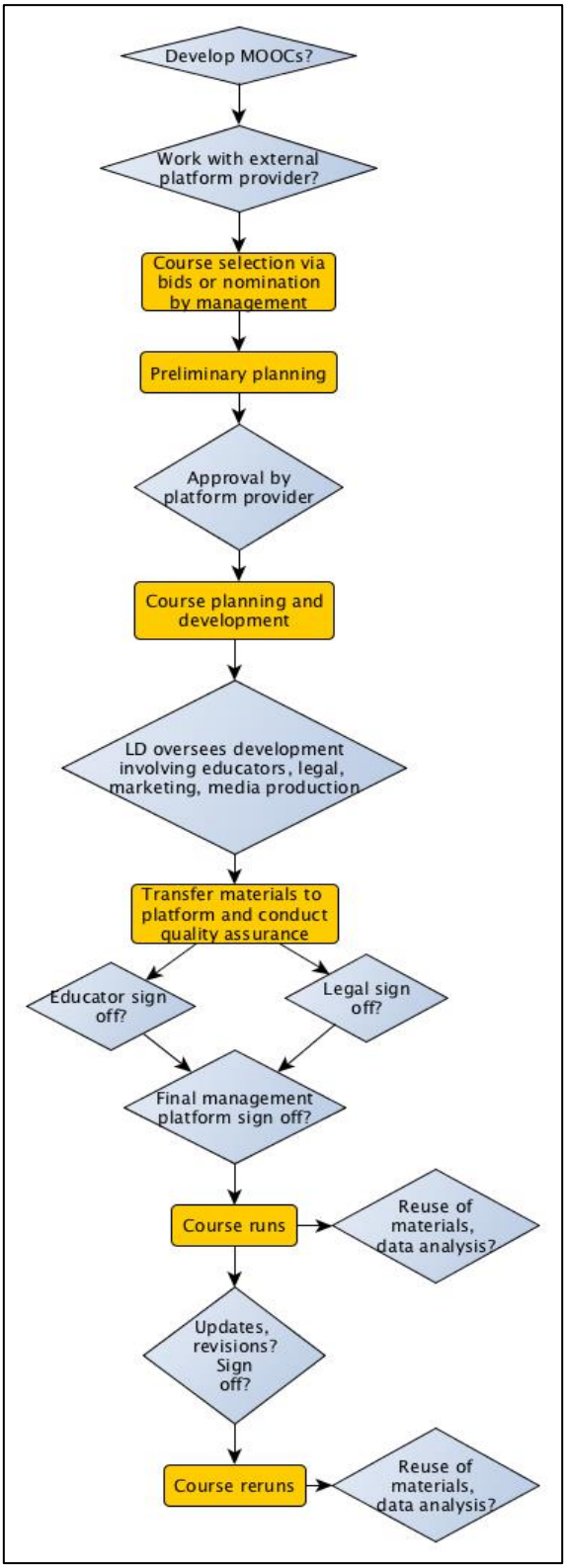

Figure 7: Overview of the MOOC development process at the case locations

Overview of MOOC development

Having made the decision to participate in MOOC development and identified a platform on which to host a MOOC, universities need to select particular subjects about which to develop MOOCs. The institutions in this study either select suitable areas for courses (UA, UC), or invite bids from departments wishing to participate (UB). Outline course plans require initial approval from an oversight board and the platform provider itself. Courses are then collaboratively planned, with LD oversight, but also with involvement from legal, marketing, and media production in addition to educator input. The degree of educator – LD control of the process varies as will be demonstrated below. Course progress is generally monitored and controlled via forms of 'waystage' meetings during which courses are checked for quality, and adherence to marketing, educational and legal criteria imposed by both the university and the platform provider. Final checks are made with oversight boards and the platform provider before courses go live, and courses are typically subject to review and analysis (of various performance measures and participant feedback) before further iterations occur.

5.1 [RQ1a] What is the relevant population of system interactors and groups involved in developing and using MOOCs?

This study has found that the types of actors, groups and non-human actants involved in MOOC development are broadly similar across the case study institutions, though specific job titles, terminology and forms of involvement may vary. Table 9 below provides a summary of the social actors, actants and core groups identified at the case sites. This section, therefore, highlights main actors and groups involved in MOOC development, thus providing an initial social foundation for understanding these initiatives as socio-technical interaction networks. More extensive variation between cases is revealed in subsequent sections which discuss factors shaping the interactions between social and technological elements of the networks.

Actors	Non-human actants	Core groups
Learning designers Educators Management Legal staff Facilitators Media production staff ICT support staff External actors (platform representatives, course partners, locations and logistics contacts)	MOOC platform Legal / marketing agreements (with platform provider) Conditions on reuse/remixing of resources HE policy frameworks Media production technologies The Web	Peer networks Professional associations (ALT, academic associations) MOOC project groups Management groups The university

Table 9: STIN findings on social actors, non-human actants and core groups identified at UA, UB and UC

5.1.1 MOOC actors and groups: commonalities across cases

A range of actors formed part of the interaction networks associated with MOOCs at each case study location (see Table 9). Those with most significance in terms of influence on course development processes and production were LDs and project managers in the MOOC development teams (acting as 'hubs' of activity, with considerable autonomy in determining their own and others' roles). LDs were identified as central actors in MOOC development by all participant groups across all cases. Educators and management also played key respective roles in

determining course content and deciding on selection and funding of particular MOOCs for development. Perhaps surprisingly two other types of actors influenced the development process quite significantly: legal staff (having significant control over content through enforcing conditions on rights and permissions) and media production teams (influencing course content, production values, and delivery style, especially through videos).

Arrangements for producing MOOCs emerged over time in response to the demands and challenges of the project (as will be discussed further in Chapter 6). As the complexity of MOOC development became apparent, LDs and project managers within centralized MOOC teams came to occupy a central role within the projects, dealing frequently with educators, management, media production, external partners and platform providers in all the cases. LDs and project managers came from a variety of backgrounds, not always within academia, and tended to hold or be studying for Masters degrees or professional qualifications, or hold membership of professional bodies related to learning design, or online learning. None held PhD qualifications, but felt they gained credibility with educators by demonstrating their knowledge and skills in practice where. Indeed, a common perception was that academics “value you for the help that you can provide them” rather than any “qualification itself” [UB_LD_05].

The educators, managers, and legal or media representatives tended to participate in projects via engagement with the LD as MOOC team ‘hub’. Educators had more conventional academic backgrounds (holding PhDs relevant to the subject of the particular MOOC). They were often assisted by postgraduate students within their subject departments who helped gather course materials and facilitate in discussion forums. Media production teams were heavily involved in projects, interacting frequently with educators and MOOC teams. This illustrates the platform provider’s emphasis on video for academic content and marketing, something which will later be shown to influence the activities of those involved in courses and the form of courses produced.

Management actors interacted with senior MOOC team members on boards or committees making strategic or funding decisions on the broad direction of MOOC initiatives. These management actors were generally academics who had been promoted to high-level managerial positions, or senior figures in other professional departments (marketing, library, ICT). These individuals had considerable autonomy and authority within their own departments, and were able to make decisions on workloads or funding of MOOC-related activities in their respective departments.

Professionals advising on a range of legal issues (copyright for course materials, permissions for location filming, release forms for academics) were significant in MOOC production. Advice on legal issues was sought to varying degrees in MOOC development, and expertise in this area was

provided from both dedicated legal teams and from individuals with relevant experience (of OER licensing, for example) in learning and teaching support functions. This will be explained further below in relation to legal agreements as non-human actants in MOOC development.

5.1.2 Non-human actants

Both social and technical influences on organisations and behaviour are important in STIN, so the role of technology in addition to social factors is foregrounded. The STIN approach recognises that non-human actants can "influence the range of actions of other actors and actants" in a system (Meyer, 2007, p.175), potentially with long-term implications. Across the case study locations, relevant non-human actants were found to be the MOOC platform, HE policy frameworks, platform-institution partnership agreements and contracts, and video/media production technologies. The way MOOCs were shaped to provide massive and open access meant that the Web formed an overarching influence as an actant in which the other aforementioned actants operated.

In the case study locations the selection and use of the particular platform has important implications for the operation of the socio-technical system. The platform selection was made at a very senior level in the organizations (going right up to the Vice Chancellors in all cases, rather than in negotiation with academics or learning designers). As a result, no advance negotiation or discussion about platform features or pedagogical underpinnings was possible among those ultimately tasked with creating the courses was possible. The nature of the platform and the legal agreements between institutions and platform provider shaped many subsequent activities in terms of course production processes, content development, and course implementation.

The platform was designed to support particular forms of learning activity, including a substantial emphasis on video and a chronological (non-threaded) discussion forum structure. This had implications for the types of activities included in courses, and the time, resources, and expertise required to produce them. Educators reported that, once they became accustomed to it, "the software was a great facilitator" [UC_ED_05] in guiding educators' approaches to course development. Indeed, after some initial frustrations, the software (or likely more specifically the learning design underlying it) was found to be "really useful as a way of structuring my thoughts about what the course would look like" [UC_ED_05]. This sentiment was mirrored across many educator comments on the planning stage of courses [e.g. UA_ED_07; UB_ED_06], especially among those who had little experience of developing courses involving online learning.

A further influence of a non-human actant was apparent in the emphasis on high quality video production. The technical and quality demands of video production meant that video specialists

were often directly involved in planning, creating, and editing course video materials [UA_LD_02; UB_LD_01; UC_LD_03] and were seen as "the silent people behind the operation" [UC_ED_01] by educators and LDs. This had implications for scheduling of course development, the imposition of certain production values, and expectations regarding delivery and content of materials. Video production technologies and values, clearly worked to "influence the range of actions of other actors" (Meyer, 2007, p.175) in that they "did push them towards certain things" and ultimately "moved their thinking" [UC_MGMT_02] and actions in terms of delivery, sequencing and overall focus of learning materials. This influence was at times more direct, with video production staff making direct decisions on inclusion of content for technical reasons, having for example decided "this doesn't look right, we will need to re-film" [UC_ED_04]. In many cases, educators also reported that their experiences with video production caused them to reflect on their broader approach to communicating during lectures or classes. This will be discussed further in section 5.7.

In one case (UB), a proxy platform was created in order to give educators a space in which to create course materials, whilst ensuring the MOOC team (only) had close control over course materials uploaded to the platform proper. This was in response to concerns about changes to course materials made by educators which may not conform to standards imposed by legal or marketing departments. The other institutions either gave educators no access to the platform whatsoever (UA) or complete access (UC). Again, this will be explored further in question 5.7, as it influenced the operation of the STINs in each case.

Wider HE policy frameworks (such as institutional and departmental priorities interpreted in relation to the REF) also shaped the way management and individual academics viewed MOOC projects. Although MOOC development teams and academics felt pressure to produce and complete high quality courses within restricted time frames, MOOCs were often seen as having limited relevance to the REF. Only 22% educators in the study considered including MOOCs as part of REF impact studies, but the majority saw little connection between their MOOC work and 'ref-able' activity. This is likely to have implications for sustainability of MOOC production if/when top-down funding is reduced.

Partnership agreements and legal contracts between the platform and the university were certainly reported to influence actor behaviour and priorities in terms of content selection, choice of video filming locations, and involvement of third parties in course development. This was particularly the case in UA and UB. At UA, a learning designer noted that "copyright is a huge part" [UA_LD_01] of what they do, whilst at UB a learning designer reported that copyright checking and other "legal issues are tremendous" [UB_LD_01] in scope. UB developed a very

stringent legal interpretation of permissible material for courses which gave representatives of the legal department a powerful voice in MOOC development processes and procedures. One legal representative [UB_LEG_01] noted that they were able to "standardize" (aspects of MOOC production, allowing far greater legal control and oversight over content (and consequently less freedom for educators in their choice of content). UC gave perhaps the most freedom to educators in course development, and placed the greatest emphasis on selection of course content which was "openly licensed and made available for use outside of the university" [UC_LEG_01]. However, this more open approach still entailed educators spending "a lot of time searching for can we or can't we use that [resource]" [UC_ED_03].

5.1.3 Relevant social groups

Although the different actors linked to MOOC development had involvement with various core groups in their broader work, they tended to rely on internal, often informal peer networks when involved in these projects. MOOC team members often sought advice from colleagues working on other MOOCs or on separate learning technology projects with whom they had previously cooperated. Some support was available from professional associations (such as the Association for Learning Technology), which produce journals, mailing lists, hold conferences and host discussion forums on relevant topics. Educators are typically members of associations relevant to their academic specialism, but as MOOCs were a relatively novel innovation when the universities embarked on the projects, little had been published or discussed in specific disciplines in relation to MOOCs. Other grouping centred on the organizational structures created to support MOOC creation, including supervisory boards, committees and steering groups.

5.2 [RQ1b] What are the incentives, pressures and impediments related to development

In the period of this study, producing MOOCs and working through a commercial MOOC platform provider allowed institutions to gain media attention and enrol very large numbers of participants. Each institution cited total participant numbers in the hundreds of thousands by 2016 (exact figures remain confidential). This has implications for both the incentives driving MOOC development (including marketing, recruitment and outreach) and the pressures and impediments shaping the development process (reputational risk, pressures on time and resources). These incentives, pressures and impediments to MOOC development are summarized in Table 10 below, and outlined in more detail in this section.

Incentives	Pressures and impediments
Marketing, reputational enhancement of the institution Recruitment of students to conventional courses Experimentation in education (esp. UC) Sharing knowledge (outreach, widening participation) Career / professional development of educators, learning designers	Reputational risk (to institutions, departments and individual academics) Time pressures Limits on resources Compliance with legal agreements (regarding agreements with the platform provider, external course partners, copyright restrictions) Compliance with institutional and platform standards for marketing materials

Table 10: Incentives, pressures and impediments related to MOOC development at UA, UB and UC

5.2.1 Incentives

Across the cases, interviewees of all types identified marketing and recruitment as the main institutional incentives for participating in MOOC development, whilst also recognizing that conducting outreach activities, developing the educational culture and widening participation also served as justifications, and perhaps additional but not central motivations for institutions to produce MOOCs. This depiction of MOOC drivers is supported in the wider literature on MOOCs (Davis et al. 2014) and in the documentary analysis part of this study, where documents related to strategy, planning or promotion of courses frequently (directly or implicitly) indicated a concern with university branding and recruitment. Participant interviews across institutions and roles frequently mentioned "spreading awareness" of the universities or their respective "brand" [UC_ED_01]. There was also a clear sense that senior university decision-makers wanted to be part of 'the MOOC experiment' as it seemed to represent a high profile innovation in online learning [UA_MGMT_01, UC_MGMT_02] which would reflect well on the institutions as forward-looking and current. One respondent at UB, for example, described how the university management "wanted to establish [the university] at the vanguard of a new era of delivery of education" [UB_ED_06].

One distinction between UC and the other cases in terms of incentives was an institutional willingness to experiment cited by respondents at UC. Indeed, a UC manager of MOOC

development at UC commented that "we see ourselves as innovative in the use of technology in education … so when MOOCs came along it would have been crazy to have been there" [UC_MGMT_02]. Documentary analysis of UC materials corroborates this sentiment in the transparency of course production processes, and the looser controls on educator involvement in course production. Although MOOC projects were seen as experimental (as they had not been previously attempted), this was not reported as a management motivation by respondents at the other case sites, or found in documentary analysis of them.

Other respondents, particularly those within the MOOC teams or educators with an enthusiasm for online learning, hoped that MOOCs would help "change the digital culture" [UB_ED_01] of the institution by encouraging wider engagement with online learning and associated technologies. Although this sentiment was found across all cases, it was not expressed by all educators. More widely shared was the possibility of personal and career development as a motivation for their involvement, in addition to the sense that sharing current knowledge and expertise was "what we should be doing" [UB_ED_02] as public educational institutions.

5.2.2 Pressures and impediments

Alongside the potential reputational benefits of participating in MOOC projects, the converse sense of reputational risk should mistakes be made also imposed pressure on actors in MOOC production. Courses were perceived to publicly represent the universities involved, and had to be delivered within fixed timeframes. Reputational risk was thus felt at both institutional and personal levels by those involved with developing MOOCs, and was reflected in the focus of some course development documents and processes (which outlined development stages and benchmarks for courses, checklists of key actions, sign offs from responsibility holders etc). One particular example is demonstrated in a documentary statement of principles of MOOC quality in which MOOC proposals are considered in light of "the management of risks to institutional and individual reputations" and ensure that "appropriate safeguards are in place". Although practical approaches to dealing with this risk varied across the case sites (as will be demonstrated in section 5.6) all actors reported an awareness of this issue, whether at the level of institutional or personal reputation. One educator at UC illustrates this in relation to interactions in discussion fora, where participants seem to strongly appreciate interaction with professors, but:

"it's not a conversation that I'm having with somebody in the corridor, it is public. And you don't know who you're talking to, and there is [sic] a thousand times more people who are reading but not commenting" [UC_ED_04]

One of the main areas of risk was seen to be in course content, where course materials had to comply with the partnership agreements signed with the platform provider. The agreements had a commercial element (the provider was a profit-making entity), and this imposed unfamiliar conditions on licensing and use of course content for many educators and the MOOC teams. Members of MOOC teams and legal representatives in all case sites reported challenges in terms of legal clearance and licensing of course content, including the production of high quality video courses - another requirement of the cooperation agreements with the platform. Further, the marketing departments within each institution also had standards for university branding and production quality which had to be met, thus adding to the burden on those producing course materials.

5.3 [RQ1c] Which actors are involved for the first time, which actors are excluded and which actions become undesirable in relation to MOOC development and use?

A range of new actors (or actors with new roles) became involved in MOOC development at each university. Alongside this, the STIN analysis considers actors that may become excluded as a result of the introduction or use of a new technology, and any resulting conflicts or activities that become undesirable as a result of the embedding of a technology into a novel context. These aspects of the STIN analysis are summarized in Table 11.

New actors	Excluded actors	Conflicts / undesirable activities
• Translation of existing roles of educators, learning designers, legal professionals • Media producers • Platform provider	• Non-participating departments and educators • Unbundled roles of educators	• Educator control of / access to materials during later stage development • Conventional lecture styles (in videos, podcasts) • Use of copyright materials and images • Use of materials which don't meet marketing standards of platform and institution • Disagreements over costs of development/allocation of funds • Questions over platform design leading to normative view of education

Table 11: New and excluded actors, and conflicts or activities that become undesirable during MOOC development at UA, UB and UC

5.3.1 New actors

Although many of those involved with MOOCs already had positions at the universities, initiating MOOC projects certainly required that new duties (within existing positions) were created for some actors (such as for educators or legal representatives). Some saw this as existing roles being "translated" [UB_ED_01] into forms more relevant to MOOC projects. This use of the word 'translate' parallels Law's (1999) explanation of "making dissimilar things become equivalent" (in Meyer, 2006: 54), as some of the duties involved in MOOC development were certainly reported to be distinct from conventional face-to-face and online roles and practices by educators and learning designers involved in the process. Consistent with third space theory (as will be discussed later), duties were often not clearly defined in terms of institutional structures or authority, but rather in relation to the project, involving "sort of slightly vague roles around responding to the nature of the MOOC which is different from anything I've done before" [UB_ED_04], and which can be very "MOOC specific" [UB_LEG_01]. In response to the sometimes novel demands of the project, educators often had to "move their thinking" [UC_MGMT_02] in new directions and accept changes to more clearly delineated roles associated with conventional course development [UC_ED_03, 04].

Though some positions (such as legal representatives) were not newly created in the universities, they moved from a more peripheral connection to online learning (as reported by themselves, educators, learning designers), to a far more significant role. This is shown in UB MOOC oversight meetings, where “we don’t have one [an oversight meeting] without legal” [UB_LD_04]. LDs in UA also report that they “work closely” with legal representatives on clearing material for use, whilst those at UC collaborated with a specialist in OER who “very much redefined what OER is” and helped the MOOC development team become “attuned” to use of resources in MOOCs [UC_LD/MGMT_02].

As mentioned in the previous section, use of video as course and promotional material was cited as an important part of the platform design and thus media production actors had a substantial role in course development activity. Although academics and learning designers had generally used video in some way in their previous work, the emphasis on video in MOOCs had implications for course development processes and content. The specific technical skills required of media producers and substantial amounts of time needed for making high quality video meant that “planning the filming [was seen as] kind of central” [UA_LD02] in MOOC production across all cases. LDs at all the universities reported tensions between priorities of course design and video production, where production processes could become quite “focused on innovation in video production” [UC_LD/MGMT_02]. Video played an important part in course promotion and in learning activities and, as discussed, this had implications for production schedules, production values, editing, and requirements for educators in terms of delivery style, content and the structure of their contributions.

However, some entirely new positions were created where ‘MOOC teams’ were assembled. This was certainly the case with universities A and C (with new appointments made in terms of MOOC project managers and learning designers/course developers). For university B, existing learning designers were tasked with taking a dual project management-learning designer role for individual MOOCs, and given some scope in terms of how projects could be conducted (hinting at the possible ‘third space’ position of the project), whilst working under the direction of an overall learning designer-project manager. In all cases, representatives of the platform provider were new actors in the projects, advising on technical/pedagogical matters (platform capabilities, new technical developments, responding to feedback from university actors etc) or promotional concerns (using social media to promote courses, course ‘launch’ videos etc). Across all three cases, PhD students from relevant subject departments were frequently recruited to act as facilitators on course discussion boards, and many educators enlisted the help of PhD students to locate relevant source materials for conversion into learning activities on the courses.

5.3.2 Excluded actors

The process of selecting departments and subject areas in which to develop MOOCs, and individual academics within those departments to produce content and participate inevitably involved the exclusion of some interested parties. Management actors reported having numerous options to choose from when calls were made for MOOC proposals. Choices were guided by evolving strategic concerns, such as supporting areas of research strength or distinctiveness (UA, UB), selecting courses for which copyright-free materials were available (UA), or the ability to experiment and reach particular audiences through the platform provider (UC). Within departments, certain academics were chosen as lead educators of or contributors to courses, consequently causing the exclusion of others. Some tensions within departments were reported by participants as a result of these decisions.

5.3.2.1 Educators as excluded from aspects of course design and development

Educators were heavily involved in initial course planning activities in all cases. However, the level of educator involvement in subsequent production of course content varied across the cases. In UA and UB educators seemed to be somewhat distanced from course production as a result of the processes by which MOOCs were subsequently developed. Technical arrangements and organizational structures shaped this process significantly, as will be discussed in section 5.6. At UA, for example, educators were often required to simply produce or identify suitable texts which could form the basis of learning activities. The MOOC team would then take on the full task of development with educators often "not involved in the course build at all" [UA_LD_01]. UA educators had 'read only' access to the course platform. This meant they had little involvement in shaping the pedagogy of activities, or the content of texts or videos other than by giving feedback after the MOOC and media production teams had constructed them.

UB gave educators more control over choices of texts and learning activities, encouraging educators to consider materials as part of an input-task-discussion structure. However, LDs limited educator access to a 'proxy' platform which allowed the MOOC team and legal department to keep overall control of course development (and importantly, oversight of rights-approved and university branding-approved content). In addition to this technical barrier of the proxy platform, educators reported that they frequently had no time to attend ongoing planning meetings, meaning that organizational structures and processes became a further factor which distanced them from involvement in and control over course development.

In contrast, UC placed more onus on educators to produce course materials themselves, giving them direct access to the platform where they could upload content, and create course activities directly. This may be partly be explained in that UC had some limited experience of MOOC development prior to collaborating with the platform provider studied in this thesis, and more depth of experience of online learning in general. This transfer of responsibility for course materials development to educators was intended to help build digital skills and capacity within departments, whilst also managing the workload of a relatively small MOOC development team. As part of this arrangement, educators had the option to contact representatives of the platform provider directly on questions of platform functionality and activity design. This approach contrasted clearly with UA and UB, who filtered all such enquiries through LDs. However, LDs at UC recognized that this could be problematic in terms of managing educator communications and expectations in terms of what support the platform provider could or should provide.

Educators at UC would periodically liaise with the members of the MOOC team to check progress or request advice or assistance, but had some freedom to produce content. These educators reported, however, that choices in content production were strongly shaped by training sessions provided by the MOOC team which outlined platform design and capabilities, and provided models for content and activity types. None of the educators at UC had previous experience in constructing MOOCs or other online courses. This approach gave educators some autonomy in course design, but was time-consuming and intensive.

All educators across the cases reported that MOOC development was distinct from face-to-face course development in this respect in terms of the level of control they had over selection, presentation and delivery of course content. The factors shaping educator roles in MOOC development will be explored further in sections 5.6 and 5.7, and in the discussion section of the thesis.

5.3.3 Conflicts and undesirable actions

Overall areas of conflict and actions that became undesirable as a result of the introduction of MOOCs centred around concerns over reputational risk for the institution linked to legal or rights clearance of materials, challenges to norms of academic communication and concerns about the platform affordances. Each of these concerns was framed within broader time pressures of producing high profile, openly accessible courses (subject to scrutiny by media, course participants, and other institutions) by particular, fixed deadlines.

5.3.3.1 Legal and copyright concerns

Participants from the MOOC teams at all case locations reported a concern with the legal and rights clearance of materials used on courses. The quasi-commercial nature of the courses (which offered proof of participation documents for sale) meant that re-use of copyright material for educational purposes was no longer possible, even under many categories of Creative Commons licence (many include a 'non-commercial' clause: BY-NC, BY-NC-SA, BY-NC-ND). The caution around legal issues partly stemmed from the potential high profile public exposure of these courses, and the overt link of courses to the university brand and reputation. These pressures were felt most keenly at UB, where course development at an early stage of the MOOC project included extensive negotiation between LDs and legal representatives on the one hand, and educators on the other. One learning designer reported spending large amounts of "time arguing the toss with them [legal] and then arguing the toss with the prof" [UB_LD_01], leading to tension among actors in course development. As the MOOC teams gained experience in course production, systems for selection and monitoring of content were established which eased this aspect of the process.

UA also reported ongoing concern about the legal and copyright status of materials used in courses because "there's always legal, isn't there" [UB_LD_01]. This concern was recognized at an early stage in course development at UA, however, and strongly influenced the course areas chosen to produce MOOCs. Course areas which were perceived to already have substantial amounts of material which were acceptable for use in legal terms were prioritized for this reason. UC invested particular effort to ensure educators understood the need for open licences on materials wherever possible. Over time they developed a much more "strict" approach to ensuring educators understood this need, using dedicated training days to explain the context of MOOC development and the need for consideration of the legal status of materials used [UC_LD_02]. This was particularly the case in ensuring video materials met the somewhat complex requirements for openness, including reuse of openly licensed images in videos, or "finding openly licensed, quality sound" [UC_LEG_01].

Although UA and UC reported less conflict or tension in this respect, MOOC teams in all case locations eventually identified and included some kind of advisor on copyright and clearance of course content. This was accompanied by formal procedures which monitored and signed off documentation relating to course 'assets', placing clear limitations on the types of content which could be selected for inclusion.

5.3.3.2 Content quality and selection

Many of the legal concerns above related to use of texts or articles from copyrighted sources, but limits were also placed on the use of certain images. Copyright clearance was required for use of images in courses, but certain quality standards were also imposed both by the platform provider and by university marketing departments concerned with following university branding guidelines. As such, educators were not able to freely choose images at any of the case institutions, with responsibility for locating and selecting appropriate images often falling to LDs or others in the MOOC teams. At UA, one LD reported that they "work quite closely with the copyright officer" on these matters [UA_LD_02], with educators often having little involvement in this beyond approving images once they've been found. Similarly, LDs at UB reported keeping close control over inclusion of images, and negotiating compromises between educators and the marketing department where disputes arose. Even at UC, which gave educators more freedom in producing materials, one member of the MOOC team was dedicated to selecting, recording and clearing suitable images for use.

In terms of course content, the copyright status of course materials was not the only factor limiting or shaping the inclusion of materials. LDs widely reported acting as filters or editors of academic texts to make them more accessible to a broader, non-expert MOOC audience. This meant that conventions for the style, density and complexity of academic communications were challenged in MOOC production. LDs at each institution reported extensive editing and rewriting of texts submitted by educators where contributions were deemed inaccessible for a generalist, international audience. This also applied across universities A, B and C in relation to educator video contributions. Traditional academic lecturing styles were challenged by media producers and LDs:

"They [media producers and learning designer] very quickly said this isn't going to work, this is too dense, this is too academic, this is too text heavy" [UB_ED_5].

"some of the videos were too technical or too specific … you realize [from editor/LD reactions] that you did not do a good job" [UC_ED_04]

This led to educators feeling the need to "essentialise" [UB_ED_05] their message, thinking in terms of short summaries of only the key points required for each learning activity, often presented as "story" or "narrative".

Some examples from UC serve to illustrate the way conventional in-depth treatment of learning content become perceived as an undesirable activity as a consequence of MOOC development across the cases. Educators at UC were fairly open to changes in practice, and realized that "there

was a learning curve in the sense that we knew what we scripted before was far too detailed, far too long, you need to keep it really short and be natural about it" [UC_ED_02] and so "trialled short summaries of key texts" [UC_ED_03] in order to make learning materials "as accessible as possible" [UC_ED_01]. This encouraged the educators to "think about things in a different way" [UC_ED_01] in order "to simplify things … to not scare the audience" [UC_ED_04]. 'Lecture-style' in-depth treatment and delivery of learning materials became undesirable in MOOC production as educators were encouraged to "think about this idea of breaking things up into small chunks so they can be repurposed and reused" [UC_LD2/MGMT_01]. From these examples from UC, it is clear that educators working on MOOCs moved away from established conventions of academic communication (extended, in-depth, cautiously phrased discourse).

Educators come to understand the learning materials they produce on MOOCs as "somewhere in the middle between engagement with the public and rigorous academic study" [UC_ED_01]. Conventional academic communication methods to some extent become undesirable activities on MOOCs as a various socio-technical elements co-construct a network of technologies with enabling and constraining effects (reliance on short, narrative video contributions within an embedded learning design on the platform for example), the promotional motivations and constraints imposed by the institutions and platform provider, and the broad nature of the target audience within the wider HE context. Though educators were initially sometimes confused by or resisted changes in norms of acceptable communication, these requirements ultimately caused educators to reflect on the way they communicate ideas in various educational contexts, as will be discussed in Chapter 7.

5.3.3.3 Resistance to the platform

One further area of conflict related to MOOC projects was concerns about engaging with a commercial platform provider and the overall cost of large-scale MOOC projects. Some of the participants who were more experienced in online learning questioned the "normative view" [UB_ED_03] of online learning as limited to a sequence of video-text-quiz activities. They felt that MOOC platform providers generally contribute to this limited understanding of the possibilities of online learning in using fairly restrictive course design frameworks. Concerns were also raised among educators at each institution about the potential high cost of the projects, and the commercial motivations of the platform provider. Some educators initially saw the project as a costly distraction "which was going to have minimal effect, and so is a waste of time" [UB_ED_04], or at least had colleagues who felt that way [UC_ED_04]. Educators also expressed frustration at the length of time required to produce videos "filming always took so long for one short video" [UC_ED_02]. Further, the demands for advance scheduling of video production

involving pre-determined content at times conflicted with academics' sense of autonomy in determining their own work commitments [UC_LD_01].

Bearing in mind the substantial costs and time demands entailed by MOOC production, there was also uncertainty amongst educators across the institutions over how universities were determining the value or benefits of producing MOOCs:

"I don't know if the university quantifies this [value of MOOCs] with the goal of saying 'no this is not a good enough MOOC' or 'no this MOOC is not giving us enough airtime'" [UC_ED_04].

However, despite dedicating substantial amounts of their time to developing courses, all those involved in MOOC development felt positive about the experience in terms of the substantial positive feedback expressed by course participants, both through formal course surveys and informal course discussion forums.

5.4 [RQ1d] How do educators and learning designers learn about MOOCs and the gain skills needed to develop them?

In all case study locations, the overall pattern of learning to produce MOOCs was similar, primarily learning through experience and interaction with others, but with some training activities in the early stages of development. The MOOC team researched the subject area, experimented via participation in MOOC courses on other platforms, and engaged with representatives of the platform provider directly and regularly before, during and after development projects. The MOOC team then determined the extent of knowledge required on the part of educators, and trained them accordingly. The main distinction regarding this aspect of MOOC production between the cases was at UC, where the institution had more prior experience of systematic online learning development, and some limited experience in producing MOOCs (on a different platform). At UC, educators were given far more autonomy and responsibility for producing MOOC learning activities, permitting them some direct contact with platform representatives, and direct access to the platform itself. This point of contact and access was not open to those at UA or UB. Overall, however, the MOOC teams in each case were involved in and guided training activities for educators.

5.4.1 Educators

All educators across the cases had at least some experience of online learning prior to involvement in MOOC development, largely through projects associated with their jobs. Many had heard of MOOCs through grey and popular media either before or around the same time as

their institutions embarked on MOOC projects. However, more formal ways of learning how to participate in MOOC development were experienced through:

- Formal MOOC project initiation meetings and training sessions from the MOOC team
- Direct interaction with the MOOC team (emails, calls, meetings)
- Open talks and workshops on MOOCs at the university (provided by the MOOC team)

A few participants (2 at UA and 2 at UB) had previously very actively engaged with Web technologies for learning activities, either through participating in very early MOOC experiments (as early as 2008, before commercial platform providers existed), or taking on 'lone ranger'-type (unsupported) projects using discussion forums before online learning became part of formal university educational offerings. Although these participants were able to take a more critical view of the affordances of the MOOC platform under study, they nevertheless reported their willingness to participate in the MOOC projects.

5.4.2 MOOC teams

LDs and project managers developed knowledge about MOOCs from a variety of sources. At UB, their experience in designing learning activities and familiarity with academic research resources and communities equipped them to take an active, practical and exploratory approach to developing courses. As a result they mainly learned about developing MOOCs in the following ways:

- Informal research on MOOCs (taking part in MOOCs as learners, researching educational literature)
- Networks of colleagues at the university
- 'Train the trainer' sessions with the platform provider
- Interactions with the platform provider representatives
- Networks of peers at other universities

The MOOC team at UA had somewhat less experience with designing online learning initiatives than at UB and UC, and perhaps for this reason reported keeping their learning design choices consistently aligned with the affordances of the platform. Interestingly the strategy of putting more onus on educators to create courses at UC seemed to produce a similar effect. UC Educators (perhaps as they weren't aware of the wider options in online course design) reported following

guidance from the platform providers and their own LDs fairly closely. In contrast, LDs at UB initially attempted some broader experimentation in the early stages of activity and course development. However, as the projects (and the complex demands associated with them) matured, even LDs at UB reported taking a more conservative approach to design, using basic platform capabilities as a guide to activity design, as will be discussed in section 8.4.

MOOC development at each case site involved LDs operating as a frequent point of support for educators and other actors in the network. Indeed, educators at the case institutions described the MOOC team as "the fulcrum" [UA_ED_07] for the project at UA, while LDs at UB were described as "the linchpin" of activities [UB_ED_05] and the "the centre of things" at UC [UC_ED_01].

5.5 [RQ1e] What are the resource flows in relation to MOOC development and use?

It was broadly recognized across the cases (and across actors within each case) that MOOCs are relatively expensive and intensive to produce in terms of time and resources. A range of resources are required to produce these courses, including expertise of various kinds (technical, legal, marketing, pedagogical), technical computer and video equipment, and other personnel costs from support staff such as paid postgraduate assistants. This section will explore resources relating to staffing, outside expertise and equipment which are used to produce a range of courses on a public and high profile MOOC platform.

5.5.1 Funding and income

In all cases, MOOC projects were funded from a 'central pot' allocated by top-level university management (including the Vice-Chancellor in each case), as they were seen as "university-wide" projects [UA_ED/MGMT_01; UB_MGMT_01] or "special projects" [UC_LD02/MGMT_01]. This central fund was initially created to 'kick-start' the projects, and was used to establish relevant organizational structures, staff training, and dissemination of information. Again, at each case site, the initial levels of funding were reduced for departments once courses had their first run, often meaning that extensive revision or refreshment of course material was not prioritized [UA_LD_01; UB_LD_3; UC_LD_01].

Sources of income related to courses were limited, although some did exist. Documentary evidence of participation was available for course participants to purchase, although uptake by students was relatively low (exact figures remain confidential). In some cases participants

reported that funds raised in this way partially subsidized the work of course mentors in discussion forums. MOOC teams were also interested in collaborating with course partners (public organizations such as museums, learned societies, professional associations) as this often involved sharing of costs in course production, and increased publicity for courses [UA_ED/MGMT_01; UB_LD_01; UB_LD_4; UC_ED_02, 05]. A further potential source of income from these courses is through recruitment of MOOC participants to fee-paying courses at the universities themselves. This was frequently mentioned by LDs, project managers, and management as a benefit of engaging in MOOC development [UA_ED/MGMT_01; UB_LD_01; UC_LD_02, UC_LD_02/MGMT_01] and pathways to study at the institutions were highlighted within some courses. However, institutions were reluctant to confirm exact figures on the relationship between recruitment and participation in MOOCs.

5.5.2 Staffing

As discussed in section 5.3, dedicated 'MOOC teams' were assembled at each university, often involving new staff, or existing staff transferred into positions quite distinct from previous roles. These teams were funded by, and were able to largely control the central pot of money in order to manage course development. Of course in each case, oversight boards or committees were in place to monitor progress and macro-level decision-making. Within the MOOC teams, the position of project manager or learning designer were often new and were funded from this central pot of money. Not all positions were funded from this pot, however, as duties such as mentoring discussion forums (often delegated to graduate students) were frequently paid for from departmental or school budgets associated with the topic area of each particular MOOC. Some educators had a fixed amount of workload 'buyout' granted by their department or school (a reduction in teaching for the time period, for instance), but often their time commitment to MOOCs ultimately exceeded this buyout and was contributed as 'goodwill' [UB_ED_02; UA_ED_03; UC_ED_04]. In addition, the amount of central support for MOOCs was often reduced after the initial 'kick-off' period, once it was felt that relevant knowledge and processes were in place to support them.

According to the MOOC teams, a sizable proportion of MOOC budgets was spent on video production [UA_LD_01; UB_LD_01; UC_LD_02]. Specific streams of funding were required for duties such as video production, where dedicated production staff worked together with learning designers and educators to produce suitable video content for courses [UB_LD_03; UA_LD_02; UC_LD_01]. In-house video production was used to some extent at each university, though UA and UB also at times used professional media production companies to make films for the course.

5.5.3 Equipment

The platform provider developed the software behind the platform on which the courses ran, so much of the technical infrastructure was managed off-site. In each case site, learning designers were in frequent contact with representatives of the platform provider in order to clarify questions of platform operation, and to request/suggest development of new functionality on an ongoing basis ("I liaise very closely with [the platform provider] … discussing roles, liaising on the whole of the production schedule … marketing schedules" [UA_LD_01]). Other development activities within institutions generally relied upon existing technical infrastructure and software (such as programs already used within subject departments), though in some cases licences for particular services were obtained in order to facilitate MOOC production (UB, for example, obtained a licence to use photographs from a commercial image repository).

In all the cases, MOOC development included high quality video production, and this demanded the use of in-house video teams and equipment or contracts with external media companies who coordinated with MOOC teams to provide equipment and expertise for video shoots. Video was highlighted by all educators and MOOC team members as a demanding aspect of course production in terms of both time and resources. Video production became especially demanding as educators tended to "depend upon them [LDs and video production staff] for everything from doing the videography and making sure everything looks ok to setting up the interviews" [UC_ED_01], particularly because video was prioritized within courses as "the central feature of each week" [UC_ED_01].

There were of course differences in the way funding was allocated to different aspects of the projects. The recruitment, training and financing of postgraduate facilitators on discussion forums was handled within schools at UA and UC, but within the MOOC team at UB. In addition, the amount of 'goodwill' contributions of time by educators (the time devoted to projects which was not 'bought out' of formal workloads) varied widely both across institutions and across departments). However, the overall characteristic of top-down funding, administered via the MOOC team was common to all case locations. This placed MOOC teams in a position to influence various aspects of the development as 'gatekeepers' of the process, but there was a recognition that the long-term future of the projects was uncertain, precisely because they relied so heavily on centralized funding rather than drawing on more localized departmental or school budgets.

5.6 [RQ1f] What are the architectural choice points in MOOC development and use?

This section outlines the choice points related to the technologies and processes underlying MOOC production at the case study universities. These choice points represent periods of debate, discussion and change during which decisions are made and which influence the configuration of the socio-technical systems (Meyer, 2014) - in this thesis encompassing MOOC development. Thematic analysis of the findings generated by the STIN analytic strategy has identified three main categories of activity in which choice points occur in this study. These are labelled strategic choices, development process choices, and content selection choices, and are defined as follows:

- Strategic choices: decisions on overall institutional strategy related to MOOCs, such as the choice of MOOC provider, the subjects about which to develop MOOCs, the educators chosen to lead them or participate in development, and the overall aims of course development.
- Development process choices: decisions related to how course development and production is to be organized, what procedures are put in place to facilitate and monitor development, and how to maintain and develop day-to-day relationships between those involved in MOOC development
- Content selection choices: decisions at a more micro level about courses chosen, their particular target audience, focus, content, and approach to using activities, video and other media.

Of course, these choices are not fixed - they evolve over time as projects mature and priorities and pressures change. Due to the complexity of MOOC production, there is some overlap between these categories and this will be highlighted where appropriate, as will points of difference between the cases. The choice points under each category are summarized in Table 12 (below).

Choice point type	Decision	Nature of decision
Strategic	Decision to participate in MOOC development	Top-down decision by management
	Overall aim of MOOC development	Promotional aims, showcasing the university. Subsidiary aims of experimentation in education and sharing knowledge.
	Choice of platform provider	High-profile selective provider
Development process	Level of learning designer control over development process	Learning designer as 'hub' model emerges, though in different forms of 'controller' (UA), 'broker' (UB), and 'trainer' (UC).
	Educator access to MOOC platform aligned to development approach	LD as hub role (as controller, broker, trainer) consolidated through configuration of platform technology and course development organisational structures
	Accommodation of diverse interests and needs	Legal, marketing and media production shape learning designer and educator activities
	Course design decisions tend toward the conservative as complexity of projects emerge	Diverse (internal and external) incentives and pressures, plus the unfamiliar nature of MOOCs ultimately produce a broadly cautious approach
Content	Course selection aligns to overall institutional aims (relates to both content and strategic choice)	Institutions select course areas for development to align with the availability of copyright-free materials (UA), research strengths of the university (UB) or the potential audiences likely to access the platform (UC).
	Accessibility, length, and style of materials adapted to meet needs of project	Considerations of audience needs, technical accessibility (across mobile devices, for example) and legal permissions influence content
	Use of video / digital media	High quality video content prioritised in courses, and media production

		values significantly shape educator contributions and control of materials
	Quality / branding concerns	Requirements for quality of images, graphics and other materials also shape educator contributions, or replace some contributions

Table 12: Summary of architectural choice points in MOOC development across UA, UB and UC

5.6.1 Strategic choices

5.6.1.1 Participation in MOOC development / Reputational enhancement as driver of MOOC development

The decision to participate in MOOC production is a fundamental choice point, and seems to be driven by two common factors across the cases. Participation in MOOC projects certainly originated from top-down decision making, with active involvement of the Vice Chancellor of each institution as a driving force. As a relatively new innovation at the beginning of this study, no explicit policy documents on MOOCs existed for any of the case universities at the start point of this study (2013-4). However, each university expressed a commitment to innovation in education and use of appropriate technology in their respective strategy statements which were operative at the time of their MOOC development initiatives. As a result, respondents at each university stated that their universities were keen to be seen to be at the forefront of innovation in HE, and saw participation in MOOC initiatives as a way to showcase the strengths of the respective universities. The idea that projects were driven by the VC or upper management of each institution was also seen as significant in terms of entailing both financial support and institutional authority by LDs and educators across the cases. It is notable that according to some study participants [UC_LD_03; UC_LD2/MGMT1; UC_MGMT_02], UC already had a stated commitment to developing its online provision with support from its VC.

5.6.1.2 Choice of platform provider / High profile platform provider

The choice of platform provider is linked to the top-down decision to participate in MOOC development. Vice Chancellors in each case were perceived to be supportive of the development of the particular MOOC platform provider selected. As discussed in the literature review, MOOCs are not a homogenous form, and many different configurations and methods of organization are possible under the umbrella term. The choice of a commercial platform provider in these cases is significant, as it signals the intent to reach large numbers of participants, and a willingness to be

associated with a third party platform with a particular public image. Decisions regarding platform provider have consequences for the nature of courses produced, the technology used, and the details of cooperation agreements struck between universities and providers (as will be shown below).

5.6.1.3 Aims of MOOC development as a 'showcase' for the universities

This concept of MOOCs as a "showcase" was one that came up across interviews at each institution, and is seen as an underlying aim of institutional participation in MOOC initiatives. In addition to the choice of platform provider, decisions regarding the underlying aims of the courses also influenced the structure and content of the MOOCs produced, as will be shown below. As this 'showcasing' strategy developed, aims of recruiting students onto face-to-face or distance courses have been articulated in relation to some MOOCs (with pathways onto accredited courses highlighted within MOOCs themselves), and high profile partnerships in course production (with other educational or professional organizations) have also been conducted. These partnerships are seen as having the advantage of attracting additional attention and funding for what are acknowledged to be expensive course development initiatives [UA_ED/MGMT_01, UA_LD_01; UB_LD_01; UC_LD_03].

Broader goals of widening access to and encouraging participation in education were mentioned in interviews, but were broadly perceived to be more important to individual academics involved with MOOCs. Although these issues of access and openness are relevant to the universities' overall mission statements, few participants in the study felt this was a strong motivation for institutional participation. This emphasis on reputation over widening participation/access is supported by document analysis evidence, with MOOC production documents focusing on reputational and institutional image enhancement, articulating key aims in sales and marketing language of "business cases" or "bids", and are based on objectives of "publicizing", "recruitment" or "scope for 'massive' public appeal". However, participants at UC did highlight the university's comparatively extensive pre-existing engagement with online learning, and the university leadership's willingness to experiment with new forms of education. For example claims that UC prioritises "outreach and getting to more people" [UC_MGMT_01] are supported by the university's "very strong drive towards open educational resources" [UC_LEG_01] both in terms of stated aims and dedicated staffing and working practices which support this aim. Indeed, some educators at UC strongly believed that their courses would primarily "inform an important public debate" [UC_ED_01]. Another participant in a management role saw MOOCs as a way to fulfil the underlying mission of universities more generally to "educate as many people as

possible" [UC_MGMT_02], whilst more practical gains of "doing some of that public engagement work … with reduced costs" [UC_ED_05].

Although a minority participants at each of the universities saw MOOCs as an opportunity to spark changes in the educational culture of the organization, this view was not seen as a major driving force behind MOOC initiatives.

It is clear, therefore, that the overarching aim of reputational enhancement of the universities involved in this study (and conversely the prospect of reputational risk) is important. As will be shown below, it shaped the context and direction of many other choice points in MOOC development.

5.6.2 Choice points in development processes

5.6.2.1 Levels of LD and educator control in course design

A fundamental choice point regarding MOOC development at all institutions was that relating to the distribution of power in course development activities. Regardless of the case site, more conventionally defined academic teaching roles of developing and testing instructional materials in face-to-face teaching (Boyer, 1990), or the collaborative work of learning designers and educators in non-MOOC online course design (Caplan and Graham, 2008) were seen as distinct to work on MOOCs by all participants. The distinction centred on a significant transfer of control from educators to LDs (and often via them to other social actors), and was a response to the challenges of establishing new working relationships with an external platform provider, and of embedding distinct development processes into the host university structure. These challenges were underpinned by the overall aim of institutional reputational enhancement that motivated the choice to create MOOCs.

As will be shown in section 5.7, LDs at each institution emerged as influential 'hubs' in MOOC development, but levels of overall control of the MOOC development process varied. Themes of LD as '**trainer**' (UC), '**broker**' (UB), and '**controller**' (UA) emerged from the analysis. These variations in the learning designer role are represented in Figure 8 below, where the differences between them are represented in terms of differing configurations of access to the MOOC platform, and differing degrees of control over materials production.

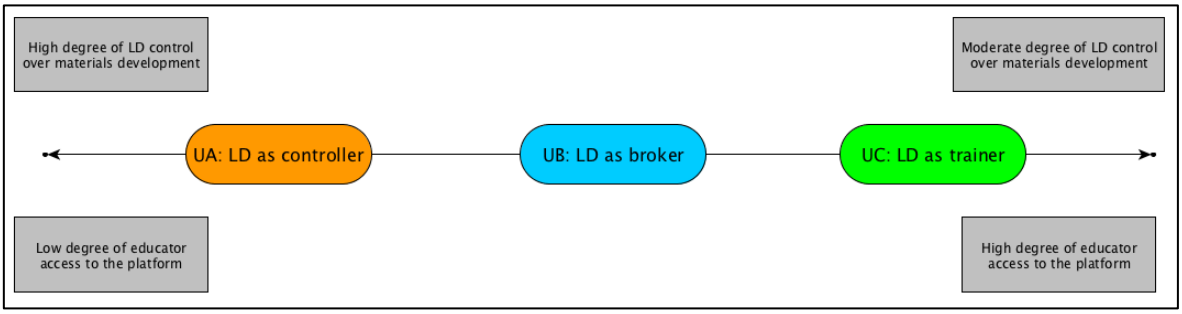

Figure 8: Differing LD roles at UA, UB and UC in terms of levels of control over materials development and access to the MOOC platform

The differences between these LD as hub roles at each university are briefly summarized in Table 13 (below). The table helps to show how overall institutional strategic decisions in selection of courses to develop as MOOCs has consequences for the balance of power in course development roles for LDs and educators. The roles become part of complex socio-technical configurations as the affordances of the platform, institutional motivations, medium of instruction (video, images, texts), and aims of the particular course interact and are embedded within each institutional context.

Table 13: Comparison of LD roles as controller (UA), broker (UB) and trainer (UC)

	UA: LD as controller	UB: LD as broker	UC: LD as trainer
Institutional reasons guiding choice of MOOC subject	Access to copyright-free course materials	Areas of research strength of the university	Suitability of course to platform and predicted audience
Educator access to materials on platform	No	No EDs can upload / adapt materials on intermediary blogging site	Yes
Level of LD control over materials	High	High-moderate	Moderate
Learning Designer roles	LDs and lead educators map out overall course aims and likely content LDs make substantial revisions to length, complexity, style of texts. LDs determine video content and edit video contributions LDs often source images	LDs and lead educators map out overall course aims and likely content LDs make revisions to length, complexity, style of texts. LDs determine video content and edit video contributions (and select educators as contributors) Protracted negotiations between EDs and legal, marketing to establish acceptable text / image content Commercial stock image licence obtained to resolve disputes over images	LDs and lead educators map out overall course aims and likely content Educators have more freedom in materials production but LDs often make significant changes and can reject materials outright. LDs determine video content and edit video contributions LDs often source images
Educator roles	LDs and lead educators map out overall course aims and likely content EDs submit texts to LDs	LDs and lead educators map out overall course aims and likely content EDs collaborate with LDs to produce activities and EDs can upload to proxy blogging site	LDs and lead educators map out overall course aims and likely content EDs trained by LDs then can produce and upload to platform directly

5.6.2.1.1 LD as trainer at UC

In contrast to the other institutions, UC maintained a somewhat decentralized approach which placed much of the decision-making related to producing learning activities in hands of the educators for each course. Efforts were made to train educator teams in materials development on each course, and encourage them to engage quite fully with course development on the platform. Educators noted that they "learned an awful lot in the process of making a MOOC primarily because of the team that was placed around me" [UC_ED_03]. They felt that "there wasn't any interference" [UC_ED_02], as LDs simply "gave us the options" from a "sort of selection that was offered" [UC_ED_04]. This training approach attempted to emulate wider practices in course development at UC, as "we didn't want a model for the MOOCs which was different from all our other educational provision … ownership resides with the academic school" [UC_MGMT_02]. Knowledge about and guidelines for MOOC production was collected, shared and developed via open wikis, and training sessions were organized which covered overall course aims/philosophy, learning design, use of media, platform capabilities and use, activity design and focus, and communication strategy [UC_LD_03].

This approach is identified here as the **LD as 'trainer' role**, and is illustrated in Figure 9 which shows the initial approach to MOOC production at UC.

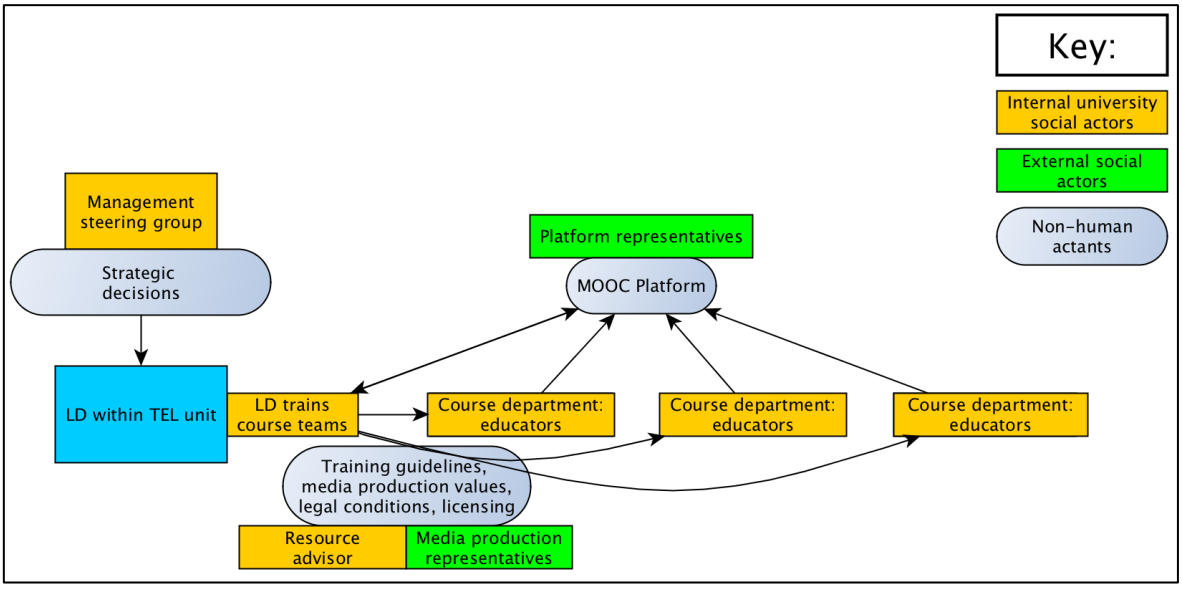

Figure 9: STIN diagram showing the initial, early-stage LD as trainer role at UC

This LD as trainer model was clearly documented in extensive guidelines on course production, and implemented to a large degree as evidenced by detailed educator accounts of the

development process. The model was based on a process where “they [educators] owned it and they devised it, and we [LDs] could advise and help them with it” [UC_MGMT1/LD_2].

However, close examination of educator and LD accounts reveals that LDs still maintained a moderate degree of control of the process after course materials were produced and uploaded to the platform by educators. Indeed, quite extensive revision of texts, and control over sourcing of images or video productions characterized some sections of the development process on the part of LDs. As a result, the LD as trainer model has been slightly revised to represent this checking and revision stage. The revised model reflects a LD role which “coordinates the quality assurance process”, involving decisions on inclusion of particular materials (videos, images, texts) and sometimes quite extensive “editing” of written texts [UC_LD_03]. Though selection and editing of work is undertaken by educators at early-mid stages of MOOC development, one of the LDs commented on an underlying sense that “I feel like I’m still leading on a lot of that stuff” [UC_LD_03]. In fact one educator reported that LD contributions to course development were an essential aid for busy academics, where “the basic principle [of MOOC projects] was that we don’t want this to interfere too much with the normal run of your schedule and your life” [UC_ED_03]. This provides a hint of the ‘third space’ activity which will be explored further in chapter 6 – that LDs could exert control over processes without reference to overt or well-established institutional structures and relationships.

Indirect LD control over the wider MOOC development seems to be enacted through LD control of “the options” reported above, or the later stage gatekeeping activities of editing and selection of materials. Documentary analysis also identified extensive guidance and indeed guidelines and requirements outlined in wikis on the MOOC course design process (relating variously to sequencing of course sections, activity design, finding images, presenting the course layout and identifying an underlying “narrative”). In a comment which captures the LD role at UC well, a participant in a management role noted the practical reality of MOOC development in which LDs “had a pretty tight grip on it and a tight overview, [though] we didn’t tell them [educators] what to do” [UC_MGMT_02]. Figure 10 below is slightly adapted from Figure 9 (above), showing this further filtering of course materials at the stage of material submission by educators.

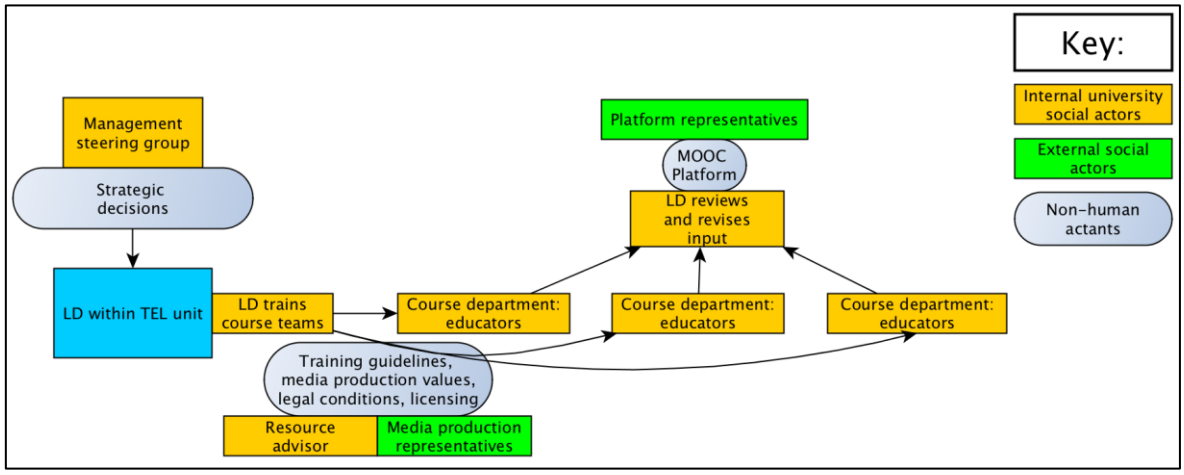

Figure 10: STIN diagram showing the revised UC LD as trainer role, which additional filtering of materials at point of submission to platform.

In contrast, UA and UB transitioned from a process which was initially embedded within course departments (UB) or relied on a simple two-way exchange between an established TEL department and particular subject departments (UA) to ones which concentrated control far more in the hands of LDs and the broader MOOC teams.

5.6.2.1.2 LD as controller at UA

The UA MOOC team initially found it difficult to balance educator preferences for activity-types with the technical constraints of a platform which was still evolving, and consequently adopted a **LD as controller** approach. Initially, uncertainty over technology and expectations for course materials resulted in time-consuming back-and-forth dialogue via email between educators and learning designers, and through LDs to the platform provider. Educators would receive basic guidance on the course requirements, then submit plans for course structures and activities for feedback from the LDs in the TEL department. Revisions from TEL representatives would reflect the technological capacities and limitations of the platform and frequently resulted in production of activities which educators found unsatisfactory in pedagogical terms. One educator, for example, reported having to "comprise what we really wanted with what was available" in a "tedious process" [UA_ED_06] of interaction with the TEL team.

In this initial development model, social actors from course departments and the TEL unit attempted to maintain their conventional roles in which educators developed courses and the TEL unit assisted in implementing them. These interactions show how social actors in the process are working in ways in which 'silos' of knowledge and expertise are clearly divided along established professional and academic functions in the university. MOOCs lack of 'fit' with established

university functions, aims, and course types presents a challenge for these working practices. This 'siloed' model of MOOC development is illustrated in the STIN diagram in Figure 11 below.

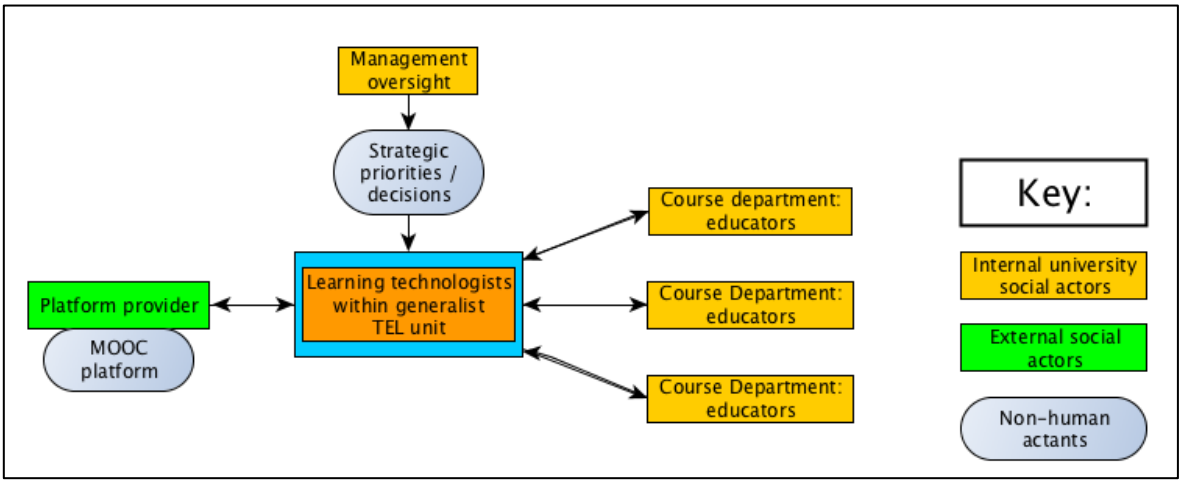

Figure 11: Initial 'siloed' MOOC development STIN model at UA

A simplified LD as controller process was subsequently established in which educators were asked to submit fairly short, simple texts to a dedicated MOOC LD team (rather than to generalist LDs in the wider TEL department). Educators were supported through materials development guidelines and documents which focused on course "narrative" or "story" structures, and conveying a clear message in each learning activity. Submissions were then converted by the specialist MOOC LDs into learning objects. This simplified arrangement is characterized here as the LD as controller model and is shown in the STIN diagram in Figure 12 below. The siloed approach of keeping course development in subject departments, supported by generalist TEL specialists is replaced by a LD as controller model, where course production is mainly located with a central specialized MOOC LD team.

Although two educators (with technical skills) were able to have more control over design processes, most educators had no access to the platform itself and reported that they "just gave them [LDs] the documents" [UA_ED_05], and in many cases also asked LDs to source suitable images [e.g. UA_ED_03]. Educator roles were frequently limited to providing "content" which could still be adapted substantially by the LDs [UA_LD_02]. Educator contributions to video production were also heavily influenced by LDs and media production teams who educators felt "know what they're doing with MOOCs" [UA_ED_07]. In this model, LDs were more able to balance the diverse internal and external demands relating to MOOC production directly. Working with text-based material, they shaped the form and content of activities and materials themselves instead of attempting to communicate the intricacies of strategic, technological, legal and marketing concerns to educators and expecting educators to appreciate and accommodate these concerns.

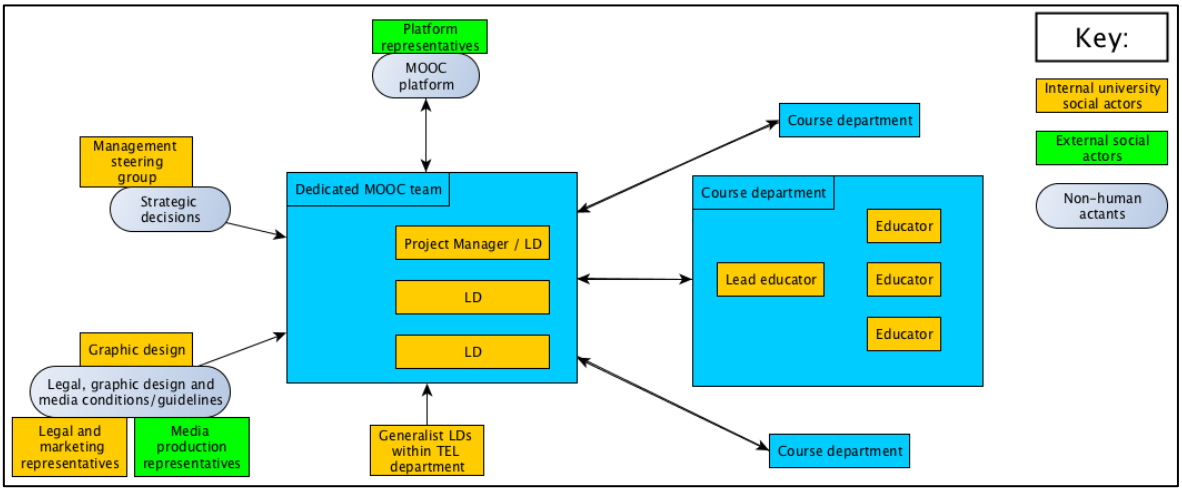

Figure 12: STIN diagram showing the LD as controller role at UA

5.6.2.1.3 LD as broker at UB

The MOOC team at UB encountered extensive conflict between internal stakeholders over the legal and branding restrictions entailed in cooperation agreements between universities and platform providers. The **LD as 'broker'** role emerged as LDs had to mediate between conflicts over acceptable content. Initial course development processes involved LDs positioning themselves within course departments, aiming to work in partnership with educators to include innovative approaches to activities (attempting the use of a variety of learning activity types, often external to the platform) and current research-informed content and learning materials. However, as the legal and technical restrictions associated with copyright and branding concerns on materials and activities became apparent, progress in course development slowed. Compared to material selection for conventional courses, development for MOOCs was increasingly seen as "frustrating" [UB_ED_02] and "a really long, drawn out process" [UB_ED_03]. As tensions between representatives of legal or marketing and educators intensified, barriers increasingly emerged in the collaborative process with educators objecting to control over materials which they perceived as excessively restrictive (compared to their conventional practices). In turn the position of the legal department became further "entrenched" [UB_LD_01] as a way to protect the university against (potentially high profile) copyright or licensing infringements [UB_LEG_01]. The initial 'course-based' model of course development, in which LDs are embedded within subject departments is illustrated in the STIN diagram in Figure 13 below.

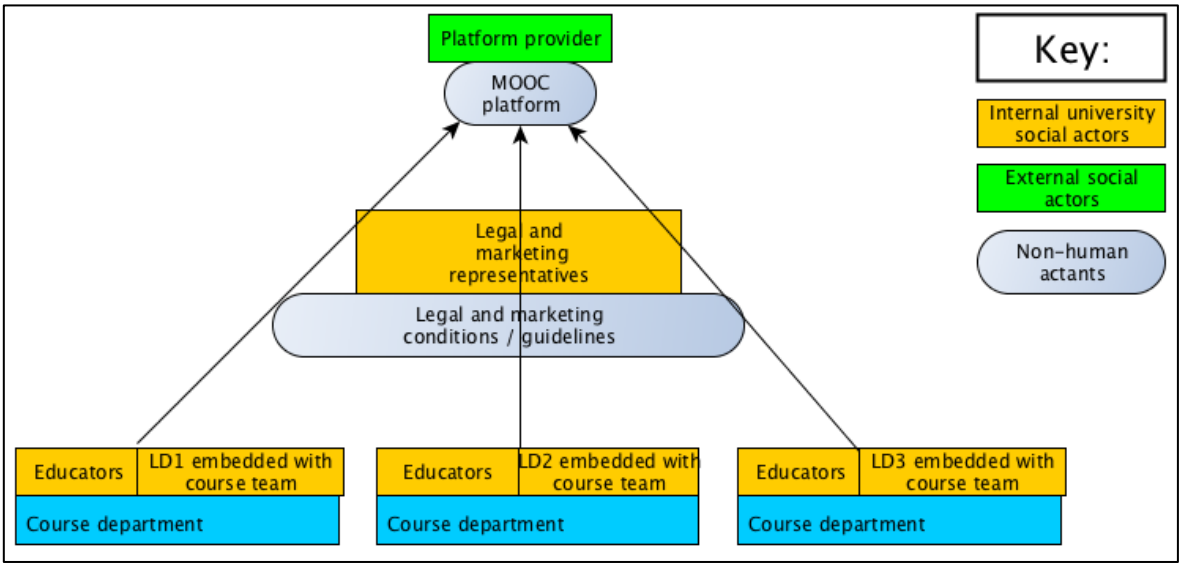

Figure 13: Initial 'course-based' MOOC development STIN model at UB

In reaction to these conflicts and the pressures of deadlines, LDs restricted educator access to the MOOC platform (see section 6.3.3 below), adopted more conservative course designs, and worked with legal and marketing departments to devise procedures for submission of materials and sourcing of acceptable images. Though LDs continued to work closely with educators from particular courses, their role changed from primarily course-based to the brokering role illustrated in Figure 14. In taking on this new role LDs were able to monitor and control content more easily, and work with the legal department to "standardize" [UB_LEG_01] procedures – in effect controlling submission of materials and images.

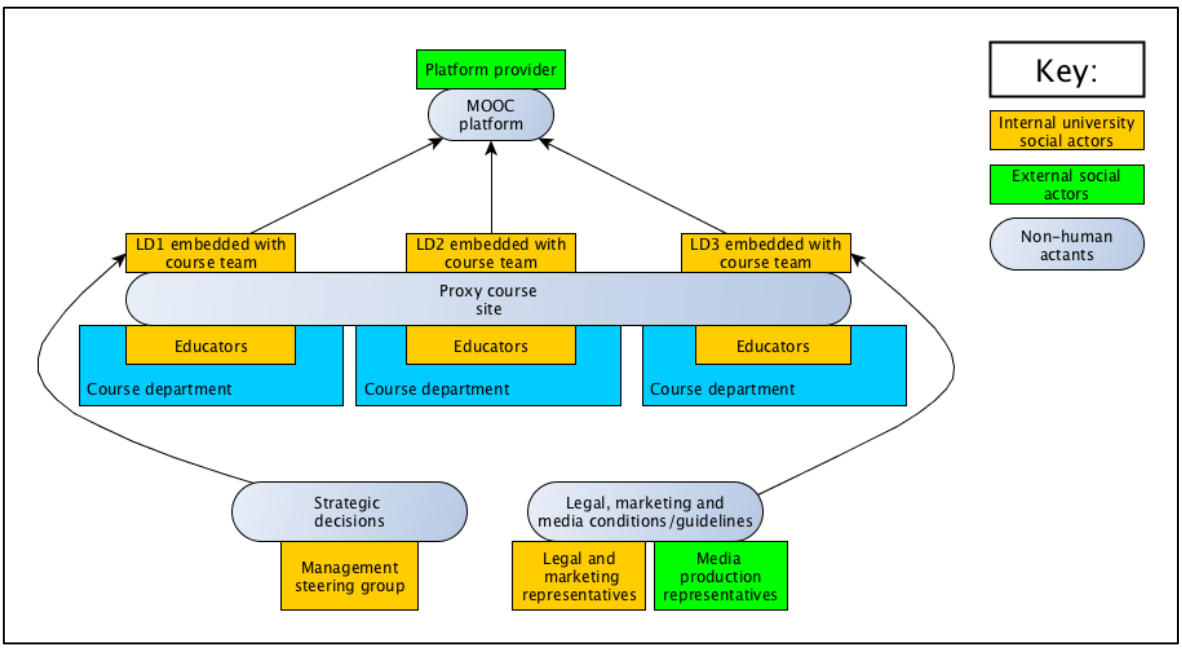

Figure 14: STIN diagram showing the LD as broker role at UB

The problems in both UA and UB cases were acute where existing institutional working practices, rules and guidelines had to adjust to collaboration with an external entity (the platform provider). Further, the demands of working in the unfamiliar context of massive and open courses (and the strategic concerns of reputational enhancement and risk which motivated institutional participation in MOOC projects) demanded more extensive collaboration between internal departments. This entailed far more interaction between legal, marketing, and faculties themselves than that to which participants, especially educators, were accustomed.

LDs and MOOC teams reported exercising control even over their own ambitions in course production as they gained experience of MOOC projects. Indeed, the MOOC team manager at UA highlighted the tension between the desire to engage in MOOC partnership projects with external organisations on the one hand, and the knowledge of the complexity that such operations entailed on the other. At the level of course design, LDs at UB initially aimed to create a range of interactive learning activities on courses, and resist the idea that MOOCs represent a pedagogically simplistic "content push" of videos and quizzes. However, under the weight of complex project pressures (time, resources, legal restrictions), the LDs made a "design decision …[of] placing a constraint on myself as well ... and that was a significant … design influence I suppose" [UB_LD_01]. As some LDs at UC had previous experience of MOOC development, they encouraged educators from the outset to focus on producing simple, 'lightweight' activities to align with the needs of the prospective MOOC audience and of the significant demands of course production. Nevertheless, even LDs at UC reported developing increasingly "strict" control over development processes [UC_LD_02] in order to manage the complexity and pressures of delivering projects on time.

5.6.2.2 Educator access to the MOOC platform

These challenges in course design led, at UA and UB, to a re-configuration of the computing systems intended to prevent educators from accessing course material on the platform itself. As indicated in section 5.3, the course design process was adapted at UA, to the extent that many educator contributions to courses were restricted to submission of text documents and perhaps accompanying images. Consequently, "educators are not involved in the course build at all" [UA_LD_01] and so had limited input into the specifics of learning activity design. Though this level of LD control over activity design became common at UA, two educators who possessed the specific technical knowledge to produce their own materials on webpages external to the platform were able to retain control on these aspects of course design. These educators were also able to open a direct channel of communication with platform technical representatives to help facilitate use of such external technology - something no other educators were permitted to do.

Here, differing levels of educator control and freedom in course design at the same institution demonstrate the enabling and constraining potential of technologies (Kling et al., 2005, p.54). Educators with a detailed knowledge of a technology were able to leverage this to create more freedom in their course design activities and decision-making. This illustrates how both technical capabilities and organizational decision-making can shape MOOC design processes and outcomes. Overall, however, the MOOC team, and LDs in particular were able to actively shape various aspects of course design, with the full approval of their line manager who was happy to "trust their judgement" [UA_ED/MGMT_01] and thus give them considerable autonomy.

At UB, a proxy platform (on a blogging site) was set up (see Figure 14), accessible to both educators and learning designers, where material could be uploaded, adapted and edited. This takes advantage of the "configurable" nature of technologies within an organizational context (Sawyer and Tyworth, 2006). As part of the 'brokering' approach, this allowed educators to retain some measure of control over the type of activities they proposed, but also gave the LDs and wider MOOC teams certainty that materials uploaded to the platform proper had full copyright or marketing permissions

These organizational and technological arrangements were motivated by the need to manage the complex legal issues associated with the reuse of materials on a commercial platform, something to which educators were not accustomed in conventional course development activities. The legal team at UB were perceived by LDs and educators to have taken a rather strict, "no risk" [UB_LD_02] interpretation of legal permissions, one which required substantial work to satisfy. Once educators had uploaded their contributions onto the proxy platform, LDs were able to transfer it to the platform proper, often making edits and changes to the materials at this stage. Although educators and LDs at UB described MOOC developments as collaborative team efforts, this arrangement clearly gave LDs a large degree of control over design processes and outcomes. This constituted a "very free hand" for LDs to make decisions on the later stages of course development and final course outcomes, according to [UB_LD_01].

As mentioned, the UC approach to MOOC development was in some ways distinct from the others, with educators having relative freedom to produce texts and learning activities, and upload them directly to the MOOC platform. In contrast to arrangements at UB, it was the educators at UC who felt they had a "free hand" in developing MOOCs. LDs and managers supported this overall view, seeking to ensure that "ownership resides with the academic team" [UC_MGMT_02] to "make decisions on content and activities" [UC_LD_03]. However, this approach was facilitated through multiple training sessions delivered to educators by the LDs [UC_LD_03] at UC, on various aspects of course production including:

- course aims/philosophy
- learning design
- use of media
- using the platform and its capabilities
- activity design and focus
- communication strategy

These training sessions also served to set the boundaries of acceptable content and activity types, thus placing limits on educators' ambitions for particular activities. At this stage, LDs were able to address potential problems of legal clearance for course materials, by emphasizing the 'entry level' nature of MOOC courses to educators. It was felt that for primary course materials (requiring a study commitment of just a few hours per week), academic articles may be of limited interest or relevance to course participants with a basic interest in a subject, and therefore the focus should be on more general, concise overview material, produced by educators themselves:

"[LDs] encouraged them that there are information resources that they may not consider as being academic, academically quality … I'm bringing that into early course-building workshops" [UC_LD_03].

"we told people, you know, this is not your average postgraduate or even undergraduate audience. You need to simplify things" [UC_LD_03].

However, similarly to UA and UB, once educators had uploaded materials to the platform, LDs reported making substantial changes to some course materials, editing texts for length, language use and adapting their pedagogical focus. In practice, the MOOC production process involved LDs taking a "mentor" role [UC_LD2/MGMT_01] "in a sense master apprentice them through the process of designing one [MOOC]" to the extent that "it did push them towards certain things". Indeed, educators described getting detailed LD feedback and advice on both overall course plans and storyboards, and particular activities, texts or videos. Educators came to use LD input on "detailed planning", overviews of "telling us [educators] whether the whole idea sounded as if it would work" [UC_ED_05] and even making "final decisions" on activities and content [UC_ED_03].

Overall, it is clear that though UC allowed more open access to the platform itself, the result of the training, documentary guidance and late stage checking of course content by LDs was that the LD team retained substantial indirect control over the course development process. Despite the initial 'free hand' for educators at training and early-stage development stages, LDs "really led the internal review process with the [academic] team" during later stage course development [UC_LD_03]. This level of indirect control is reflected in a previous comment (see section

5.6.2.1.1) by one manager who noted that in practice LDs "had a pretty tight grip on it [course development]" but that LDs were careful to negotiate this control carefully with educators in making sure that "we didn't tell them what to do" [UC_MGMT_02]. This control was in part motivated by the inherent reputational risks in producing MOOCs – "we wanted no failures" [UC_MGMT01/LD_02].

5.6.3 Choices regarding course content

5.6.3.1 Course selection

Universities had a wide range of courses to choose from in terms of creating MOOCs, but limited resources with which to do so. UB selected courses linked to the particular research strengths of the university, and its reputation for quality in those areas [UB_LD_04]. UC had a similar approach, but had already been involved with MOOC projects with other platforms, so also chose courses which matched to the perceived strengths and audience type of the platform provider [UC_LD/MGMT_02, UC_MGMT_02]. UA also shared a concern with its own subject-area strengths, but in addition approached MOOC development purposefully as a semi-commercial venture from the outset. This meant consideration of copyright and ownership of content was included as a key criterion for the selection of courses themselves [UB_LD_01; UB_ED/MGMT_01]. As a result, subject areas in which the university had substantial archived material (texts, images, video etc) were prioritized for inclusion in early MOOC development. This allowed them to avoid some of the legal wrangles experienced at UB in clearing content for inclusion in courses.

5.6.3.2 Accessibility, length and style

Course content in MOOCs had to address a number of legal, technical and educational concerns in order to warrant inclusion on courses. As noted above, a key requirement for course materials is that they should be cleared in terms of legal copyright and for quality and branding standards. This entailed instituting monitoring processes in course development and the use and configuration of particular technologies and resources (e.g. a proxy platform and commercial image bank in the case of UB). The platform provider also required course content to be accessible to learners across a range of digital devices, meaning that content, tools or technologies external to the platform were sometimes "narrowly constricted" [UA_ED/MGMT_01]. Further, LDs reported having to work hard on text-based content to make it appropriate for a broad, generalist audience. LDs across the cases reported editing texts submitted by educators at times quite extensively where content was deemed too technical, or texts simply too long for the anticipated audience and planned time commitment proposed for

learners undertaking courses. In many cases educators were told that certain sections of courses have “just too much material” [UC__ED_03] or were “too heavy, too academic” [UB_ED_05]. Choices of course content, then, were guided by a range of legal, technical and academic considerations that extended well beyond the control of educators alone.

5.6.3.3 Use of video and digital media

A further relevant choice point in MOOC development was the use of video in courses, which brought with it concerns with quality, time- and resource-intensiveness. Though not the dominant feature of courses (LDs reported trying to achieve a balance between types of content delivery), creation of high quality video was seen as an important part of courses, and was required as part of the cooperation agreement with the platform provider. Documentary evidence shows that both the platform provider and the institutions involved were keen to promote their reputation through production of quality materials.

The need to produce high quality video entailed the use of skilled media production staff (staff both internal and external to the universities were used), but also imposed heavy demands in terms of time and resources. In addition to demands on resources, educators were often unused to the style of delivery expected in short video segments, and reported difficulties in adjusting to kind of planning and delivery of their messages that was required [e.g. UA_ED_02; UB_ED_05; UC_ED_02]. At UC, for example, one educator found that their use of academic style was “too technical or too specific” [UC_ED_04] and conflicted with LD and video producer expectations for content. Shooting video also produces extensive amounts of material, and the decision-making in editing often fell to the video production teams and LDs rather than educators, thus giving a further dimension of control of content to LDs. Indeed, at UC a video produced for one course was rejected outright by the MOOC team as it didn’t meet expectations for quality – “I said no, because I was not prepared to compromise the quality levels that we had” [UC_LD_01]. This clearly indicates that decisions on video production are important choice points in MOOC development, and are ones which reside outside of educators’ sole control.

In addition to video, use of other digital tools also influenced issues of control over course design. Some off-platform tools used in courses (live chat forums, interactive timelines, polling systems) had to be controlled and administered by LDs as many educators had limited time or technical knowledge to do so. In some courses at UB for example, certain off-platform features were removed from courses after the initial run, as educators had no time or technical ability to update the content, whilst LDs lacked the scientific subject knowledge to make the content choices required [UB_LD_03].

5.6.3.4 Quality and branding concerns

As mentioned in relation to video, the quality of course materials was a priority in MOOC production. This was not only because of platform requirements, but also related to branding and quality guidelines imposed by the universities themselves. UA, for example, frequently used graphics (graphs, charts, presentation slides) produced by a dedicated design department in course materials [UA_LD_01, UA_LD_02]. LDs at UB reported mediating disagreements between educators and marketing representatives over choices of particular images for inclusion in courses. Objections were raised about some key course images which "didn't meet the University brand, [and] didn't meet the [platform] brand" [UB_LD_02]. At UB, such conflict arose where educators prioritized the academic accuracy of images to be used, whereas marketing were more concerned with appearance and quality of materials used. The disagreements were eventually resolved through the purchase of a licence from a commercial stock photography company, adding a further element to the technology package required for MOOC production at that institution. Though educators had more freedom in their decision-making at UC, quality of video and visual material was also a direct concern of LDs who reported having a "final say" over the overall acceptability of materials produced and later used and were "not prepared to compromise quality levels" [UC_LD_01].

5.6.4 Summary

This section has shown how the overall aim of reputational enhancement (and converse sense of reputational risk) has partially shaped the choices made by those involved with developing MOOCs. The configuration of the platform, use of supplementary tools and technologies, and the processes by which MOOCs are produced become intertwined in the organizational structures of each university. The analysis has shown these particular architectural choice points on matters of strategy, development processes, and course content take on significance within MOOC development networks. The following section maps these choice points to the overall socio-technical characteristics of MOOC development networks at the universities.

5.7 [RQ1g] How do the architectural choice points map to the socio-technical characteristics of the system?

Media depictions of MOOCs outlined in sections 2.3 and 3.4.1 describe an unstoppable technological wave which will transform teaching and learning across universities, allowing top academics to reach massive numbers of individuals directly. Research and commentary in academia is more measured, but nevertheless lacks empirical work on the production of MOOCs and those who produce them (Veletsianos and Shepherdson, 2016). This section provides a contrast to the 'standard tool' (Kling, 2000; Kling et al., 2003) model of MOOCs by summarizing the findings of the STIN analysis, mapping the key characteristics of the socio-technical system of MOOC production. This section demonstrates the links between the institutional promotional aims underlying participation in MOOC projects to the features and processes of course development that arose out of them. As part of embedding MOOCs into particular institutional contexts, conventional educator roles are challenged as their typical course development practices have to accommodate diverse demands associated with creating massive and open courses. LDs emerge in a hub-like role to negotiate and coordinate between these diverse interests and demands, taking on particular roles which have to balance institutional priorities, educator preferences, and rules and guidelines associated with professional in marketing, legal and media production functions.

5.7.1 Promotional aims and institutional implications

All three universities were motivated to participate in MOOCs in order enhance their reputations and 'showcase' their work to a wider public via the massive and open qualities which these courses can exhibit. A desire to appear current and avoid 'missing out' on a potentially important development in higher education also underlies this aim, whilst an intention to explore and experiment with new models of education was also present to some extent (especially at UC). Funding for projects was typically allocated from overall university management rather than within departments. In these circumstances, the universities chose to collaborate with a high profile, commercial platform provider as the basis for course development. This decision brought with it unforeseen consequences as technical and contractual requirements of a massive and open course led to the need for particular standards of accessibility, forms of learning activities and texts, use of high quality video and images, and legal clearance for content, participants and external locations.

Attempting to accommodate these social and technical requirements within the established course production practices of the universities presented a challenge. As shown in chapter 3, embedding technologies into existing organizational and social contexts brings with it complexities and sometimes unexpected consequences. In the case of these universities, the roles and practices of those involved in course development were negotiated alongside system architectural choices made in relation to strategic goals, course development processes and course content / structure.

5.7.2 Challenges to conventional educator roles in course development

An important finding of the STIN analysis is that conventional educator roles in face-to-face (as conceived by Boyer, 1990) and online course development (see Caplan and Graham, 2008) were challenged. Such challenges emerged as universities attempted to reconcile their aims of reputational enhancement, the requirements of the platform provider, and the working practices and priorities of professionals in online learning design, management, legal, marketing and media production roles. Importantly, the sense of reputational risk that accompanied the aim of reputational enhancement seemed to encroach upon Boyer's 'Teaching' role of educators, particularly in relation to educator control of "developing … instructional materials" (1990). For example, at one institution 'MOOC developers' are charged with ensuring that all "information, publicity and promotional activity" is "fit for purpose". In comparison to conventional courses, participants reported novel requirements introduced in various areas as follows:

- Access to the final course materials was somewhat limited - final decisions often rest with LDs (see 5.6.2; 5.6.3)
- Selection of content - length, complexity, and tone of course texts contrast to conventional courses (see 5.6.3)
- Use of video - educators were required to adapt to video production values and in doing so simplify and "essentialise" key messages, and "perform" in unfamiliar ways (scripted conversations, documentary style narratives), whilst their contributions were heavily edited (see sections 5.5.3, 5.6.3.1)
- Use of images - sourcing and approval of images substantially moved out of educators' sole control (5.3.1, 5.6.3.1)
- Quality and branding concerns - content was subject to approval by a range of seemingly peripheral actors including marketing and the platform providers (5.3.1, 5.3.3)

- Copyright and legal - legal oversight of content and collaboration with external parties was extensively required, and these concerns undoubtedly influenced the content chosen for inclusion in courses and at times influenced the courses/areas which were chosen to produce MOOCs (5.2.2, 5.3.1, 5.6.3)

These findings will be discussed in more detail in relation to current understandings of the nature of LD and educator roles in online learning projects in the Discussion section.

5.7.3 LDs as hubs

As a result of these socio-technical requirements, novel MOOC-related organizational structures and roles emerged as the MOOC projects became embedded in each university. Perhaps the most significant finding is that of the position of LD as a "hub" within the network of "people, documents, legal arrangements, enforcement mechanisms and resource flows" Kling et al. (2003, p. 48) which constitute the STINs at UA, UB and UC. This thesis characterizes this structure as one in which the LD actively interprets and filters the needs and demands of other social actors, whilst also influencing the organizational and technological choices underlying courses. This hub role can be clearly identified in document analysis and interviews with educators who characterize LDs as the "linchpin" [UB_ED_05], "the centre of things" [UC_ED_01] or "fulcrum" [UA_ED_07] of activity. As will be discussed further in section 8.4.5, the role seems to go further than the bridging (Cowie and Nichols, 2010) or "brokering" (Keppel, 2007) role identified in non-MOOC online learning initiatives (see Discussion section 8.3, and section 2.10.4).

Initially, models of MOOC development differed markedly across the sites, especially between UA and UB as shown in depictions of 'siloed' and 'course-based' approaches in section 6.6.2.1 and Figures 11 and 13. However, as the complexity of MOOC production became apparent, the LD as hub model emerged more clearly. This hub model was found in all cases, though the socio-technical networks of MOOC development exhibited variations as projects became embedded in their social and organizational context. Variations included the amount of control afforded to educators in materials and activity development, or levels of access to the platform, which were mediated at UA, UB and UC through LD as controller, broker and trainer hub roles respectively. See Figures 10 (UC), 12 (UA) and 14 (UB) for diagrams of each. Nevertheless, in-depth examination of documents and participant accounts produced by the STIN analytic strategy highlight the commonalities in the hub-like roles which the LDs shaped and negotiated in each context. Figure 15 below illustrates the overall LD as hub role in MOOC development. This STIN diagram demonstrates how LDs mediate between diverse social actors and non-human actants

both internal and external to the universities.

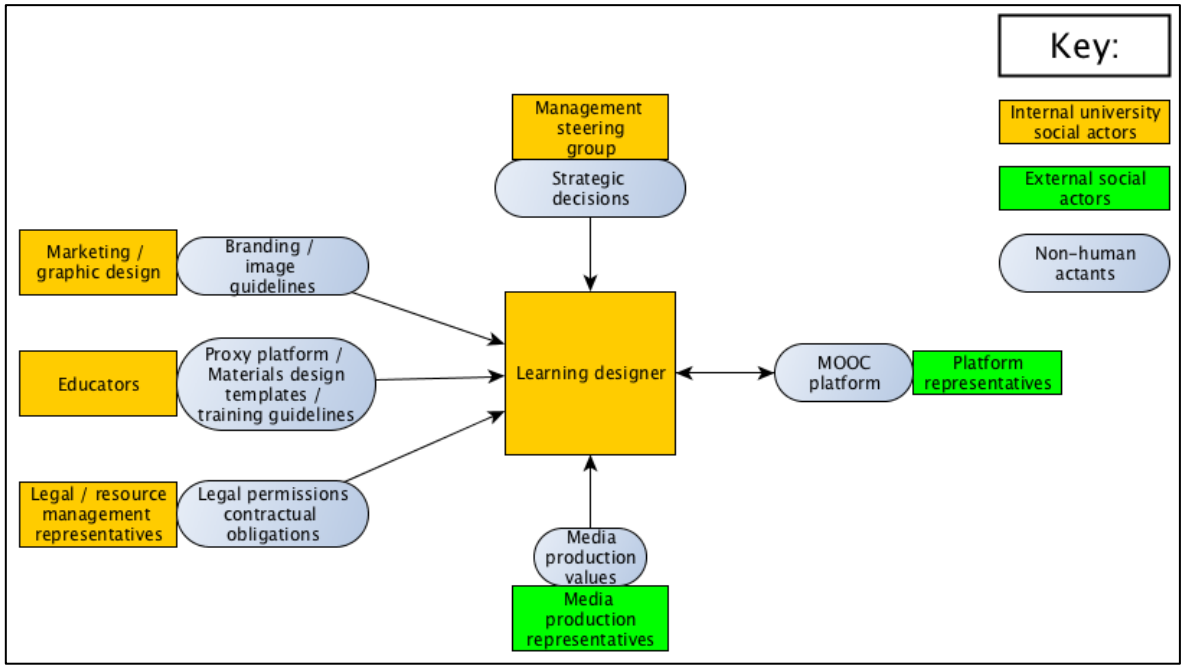

Figure 15: Simplified STIN diagram depicting the hub position of LDs in socio-technical networks of MOOC development at UA, UB and UC

LDs position themselves between a range of social actors, with access to resources and ability to co-create, with other actors, the technological arrangements, procedures, roles and enforcement mechanisms related to MOOC projects. As LDs endeavour to interpret and embed the technical and legal demands of the platform into the complex organizational context of the university, actors who may be perceived to be more peripheral in conventional course development activities (legal, marketing, video production) take on significant and influential positions in MOOC production networks. The idea of the significance of peripheral actors will also be taken up in the Discussion section 8.3.2.

Alongside strengthening social ties to seemingly peripheral actors, LDs make technological decisions, embodied in actants within the socio-technical networks. Examples include withholding or limiting educator access to the MOOC platform itself (UA and UB respectively), or directing access via the training of educators in their use of the platform, partly embodied in online guidance and production rules stored in wikis (UC). LDs at each institution shaped the range and types of learning activities made available to educators, over time tending towards more conservative course design decisions. These technical decisions were made in the context of limitations of time, resources and stringent approval processes governing acceptability of course content. At times this had the effect of limiting further certain conventional educator roles of developing and testing instructional materials (Boyer, 1990), thus reducing educator contributions to sourcing or production of texts which were often subsequently edited or simplified by LDs. In

these circumstances, the platform itself is positioned as an actant in relation to educator roles, as it can "influence the range of actions of other actors and actants" in the socio-technical system (Meyer, 2007, p. 175). Though there was relative consensus that course development was a collaboration or "co-creation" in terms of course philosophy, the practical reality of the hub-like role of LDs was acknowledged by educators and LDs across the cases with interview data showing that educators felt that LDs "make" (UB) or "build" (UA) the courses, and can often determine decision-making in later stages of course development.

It is interesting to note that the educators who did retain more substantial control over elements of their courses did so via their technical ICT knowledge. Two educators at UA, for example, were able to design and run 'off-platform' applications as part of their courses. This meant they could to some extent bypass the LD as hub and interact directly with platform representatives on choices over activity content and structure. In practice, this technical knowledge allowed educators to retain more control than even more senior educators who faced more intractable legal or marketing constraints on choices of course material. Likewise at UC, educators were trained in the basic use of the platform and encouraged to develop (very simple) inputs themselves. However, the relatively limited range of activities available (and educators' relative lack of online teaching experience) meant that they followed the guidelines established in training sessions with LDs quite closely, who still retained mechanisms for control of final course content.

5.8 Chapter summary

This section has addressed research question 1 in highlighting the socio-technical interaction networks which form around MOOC development projects at universities A, B and C. These projects are underpinned by strategic concerns of reputational enhancement (and consequent reputational risk), concerns which are both motivated and magnified by the potentially massive and open characteristics of MOOCs. This has subsequent effects for the types of actors involved in MOOC development and the extent of their involvement.

The STIN analysis has revealed networks of MOOC development at UA, UB and UC in which LDs come to occupy hub-like roles (characterized as controller, broker or trainer respectively). These LDs as hubs have significant amounts of autonomy in and control over course development processes and outcomes. LDs are able to coordinate and configure organisational and technological arrangements at each institution, drawing in seemingly peripheral actors across academic and professional departments to the course design process, whilst to some extent limiting or challenging educator control over courses. In line with understandings from the S.I. literature (Kling et al., 2005), these STINs form as social and technical factors intertwine in the

process of embedding MOOCs into the particular institution, with opportunities to adapt (configure) technologies by taking advantage of their enabling and constraining potential.

An important aspect of Social Informatics and within it STIN studies is the incorporation of relevant social theory. The following section thus addresses research question two on the roles of educators and LDs in MOOC development by bringing together these STIN findings with the social theory of third space activity and unbundling in HE.

Chapter 6: Findings 2: Third space processes, LD as Blended Professional hubs and unbundling of educator roles

The previous findings section presented the results of the STIN analysis in order to answer research question one. It showed that the universities entered MOOC projects aiming broadly at reputational enhancement (leveraging and reacting to the massive, open and high-profile potential of these courses), and that the consequent decision to work with an external, commercial platform provider had a range of implications for the course development process. Analysis of MOOC development revealed a socio-technical network in which LDs come to play a hub-like role, working with a range of seemingly peripheral actors who take on some roles more conventionally associated with educators. Indeed, educator roles become constrained by a complex range of organizational and technological factors.

This section brings together social theory (of third space activity in HE) with the STIN findings in order to address research question two:

What are the roles of educators and learning designers within MOOC development projects?

The aim is to add depth and rigor to the research in line with recommendations of both Social Informatics and Web Science approaches (Kling et al., 2003; Tinati et al., 2012). Third space theory predicts the emergence of "broadly based, extended projects across the university, which are no longer containable within firm boundaries, and have created new portfolios of activity" (Whitchurch, 2013, p.25). The STIN findings are used as data to 'knock' against this theory (Ashwin, 2012, p. 944). Drawing on the work of Whitchurch and Gordon (2010) (see section 2.13), this section interprets the STIN findings through the lens of third space processes of:

1. **Contestation**: tensions and challenges of working across professional and academic spheres become apparent. Individuals define themselves in relation to 'rules and resources' of an institution for pragmatic reasons, but may not privately identify with them.
2. **Reconciliation**: negotiation of difference as the possibility for fruitful collaboration emerges. Critical exchange and sharing of multiple perspectives occurs in the context of commitment to overall ideological aims of a project.

3. **Reconstruction**: active participation of individuals toward the creation of a pluralistic environment in which new rules and resources are created in relation to the new space. New identities and networks develop, perhaps alongside new language or extended understandings of certain terms.

This provides a way to evaluate the extent to which the roles of LDs and educators are shaped within the "dynamics of third space environments" whilst also considering the socio-technical features of MOOC production identified in the STIN analysis (such as significant system architectural choice points).

The extent to which LDs establish their hub-like role in MOOC development by operating as 'blended professionals' within this third space in HE is also considered. As discussed in section 2.13, blended professionals are those in HE "recruited to dedicated appointments that span both professional and academic domains" (Whitchurch, 2009, p.3) as opposed to more conventional academic and professional roles which are contained within more well defined structures and bounded roles. The STIN analysis has revealed how LDs mediate between a range of actors, organizational arrangements, and technological choice points via this third space in which conventional educator course development roles are challenged. However, it is useful to view the STIN findings through the social lens of blended professional activity (in terms of spaces, knowledges, relationships, legitimacies) in order to understand the extent to which these dimensions contribute to the hub-like role uncovered in the STIN analysis. By considering both these social and technical elements of MOOC development, a richer understanding of the roles of LDs, educators and other relevant actors can be generated.

6.1 Contestation processes: attempting MOOC production within existing university structures

In the early stages of MOOC development initiatives, universities A and B attempted to organize course production within existing institutional structures and procedures. As will be discussed, they adopted organizational structures for course production which are here characterized as 'siloed' (UA) (section 5.6.2.1.2) and 'course-based' (UB) (section 5.6.2.1.3). This resulted in a range of "tensions and challenges of working across professional and academic spheres" (Whitchurch and Law, 2010) as is characteristic of the contestation phase of third space activity. Such contestation processes are predictable in these case studies, as MOOCs fail to align fully with established university business models (Yuan and Powell, 2013), overall mission (Daniel, 2014) or approaches to teaching and learning (Siemens, 2013). Perhaps as a result of the institution's

previous experience in online learning development and MOOCs, UC adopted a more flexible 'training-based' model which had some third space characteristics from the outset.

The STIN analysis contributes an understanding of the role of technology in these contestation processes. It highlights, for example, the challenges posed by the lack of fit between established educator course design practices and the evolving nature of the platform architecture, or by the unfamiliar requirements for producing video or sharing copyright materials.

6.1.1 'Siloed' development roles: UA

The early-stage UA approach is characterized here as a **'siloed'** approach in which the main organizational groups involved were a centralized TEL department and academic subject departments (see Figure 11). Boundaries between and roles of individuals within the two groups were based on pre-existing institutional demarcations and functions, lacking 'blended' elements which span domains (Whitchurch, 2008). Educators on early UA MOOCs produced activities and materials in relative isolation from the TEL departments, then received email feedback from the TEL teams [UA_ED_05, 06].

Participant accounts describe how courses were chosen for development partly on the basis of departments having sufficient banks of copyright-free learning materials available for use [UA_LD_01; UA_ED/MGMT_01; UA_ED_07]. This helped satisfy the copyright limitations of working with a commercial platform provider. In these early stage development processes, subject course teams proposed learning activities and content (often based on these banks of existing material), which was passed to the MOOC team who then tried to accommodate it within the (emerging) technological capabilities and constraints of the platform. Communication was mainly via email exchanges (between LDs and educators, and LDs and the platform provider) and progress was described by educators as a slow, "tedious" process [UA_ED_05]. The technological capabilities of the platform were still being developed at this stage, so the range of choices available to educators was ambiguous but at the same time offered "limited functionality" [UA_ED_04]. This "trial and error" process (UA_ED_05) led to tensions as educators attempted to design learning materials and activities in conventional ways within established systems but found them inefficient, frustrating and "tedious".

6.1.2 Course-based development roles: UB

Early-stage development at UB followed a different model in which individual LDs were based within subject departments, and given main responsibility for a particular MOOC. In contrast to UA, this **'course-based'** approach led to a more direct, flexible relationship between LDs and

educators, but created substantial tensions with professionals in legal and marketing functions (see Figure 14). These LD-educator partnerships resembled conventional (pre-MOOC) arrangements for support between academic departments and the TEL team.

Initially the partnerships enabled attempts at more creative, subject-specific learning designs, but over time they found legal and marketing conditions linked to platform partnership agreements far more restrictive. LDs found themselves mediating between groups, who were applying the distinct "rules and resources" (Whitchurch and Law, 2010) of their own departments. Educators, for example, prioritized using authentic, academically accurate texts or images which accurately represent "what the course is about" [UB_LD_02]. In contrast, legal professionals insisted on use of copyright-cleared, 'safe' materials, taking a "no risk" approach [UB_LD_01] where "we have to go through every asset used" [UB_LEG] on any course. These rules came into conflict as the socio-technical implications of implementing high profile, massive and open MOOCs in the institution became apparent. Educators found their academic freedom limited by legal requirements (for non-copyright texts) or marketing guidelines (for high-quality images), resulting in "continual fighting" over acceptable content [UB_LD_01].

6.1.3 Training-based development roles: UC

As mentioned in the section introduction, UC drew on previous experience of online learning and MOOC development to establish a **'training-based'** model. The LD team provided a series of training sessions to educators involved in MOOC development, encouraging them to produce simple (non-copyright), somewhat "lightweight" [UC_LD_03] course materials themselves. Via this training and online wikis as 'rules and resources' for projects they were able to set clear expectations and set boundaries of activity with educators, most of whom were inexperienced in online course development, so reported being willing to follow guidelines quite closely.

This approach reduced potential conflict in course design, and to some extent showed a redefinition of professional space and boundaries characteristic of blended professional activity (Whitchurch, 2009). The training approach was directly and explicitly linked to "capacity building" [UC_LD_01] across UC as a strategy which "aligned with what we [the university] wanted to do" [UC_MGMT_02], whereas MOOCs projects at UA and UB were in some ways more tentative and self-contained. However, the challenges of video production, time pressures and budget constraints still caused tensions to emerge. In common with UA and UB, educators found that producing the style and content of short video material advocated by the platform provider was both "demanding" [UC_LEG] and "tedious" [UC_ED_04].

As a result, tensions and challenges emerged at all three institutions in respect to video production as requirements for this medium contrasted clearly with those of educational settings to which the educators were accustomed. Overall, it became clear that "there's a lot to learn about video for them [educators]" (UC_MGMT_02) as "that's something than none of us had experience in before – producing really short educational videos" (UC_ED_03).

6.2 Reconciliation processes: LDs move into the third space 'hub' role

As the scope, complexity and uncertainty of MOOC development projects became apparent, LDs began to draw on roles characteristic of third space blended professionals in HE. The third space "represents activity that may not fall explicitly within formal organisational structures, in environments that are more complex and dynamic than organisation charts and job descriptions might suggest" (Whitchurch, 2013, p.25). To manage this complexity, third space actors typically pro-actively interpret and define their own roles, acting as blended professionals (Whitchurch, 2008). Illustrating this blended role, LDs across the case sites found MOOC development initially to be a "mysterious process" [UB_LD_05], in which they had to "find their way into systems" [UC_LD_02] and "create their own role" [UB_LD_03].

These ambiguous, blended 'spaces' allowed LDs to conduct 'reconciliation' processes of negotiation and critical exchange with a range of actors across institutional boundaries (Whitchurch and Law, 2010) to help embed novel MOOC development processes and technologies into the institutions. As part of this embedding process, conventional educator roles (e.g. Boyer's Teaching function of 'developing and testing instructional materials') were unbundled in that they were subject to "sub-division of academic work into specialist functions" (Kinser, 2002). This unbundling occurred via negotiation of roles (highlighted by the third space lens) on the one hand, and via system architectural choices (identified in the STIN analysis) on the other. As will be demonstrated, sometimes these processes of negotiation and the making of architectural choices were intertwined. This occurred where particular roles were consolidated via, for example, configuration of access to the platform, or where the assertion of particular roles (learning designer as hub) entailed particular course design decisions.

Coding of case study data revealed that LDs at each institution operated as blended professionals in a number of respects in the reconciliation and reconstruction phases of MOOC development. Table 14 ('Dimensions of BP activity at UA, UB and UC') shows the particular dimensions of blended activity identified across the case sites. The column marked 'Dimension' shows the dimensions of blended professional activity identified, whilst the 'CP as part of blended activity' column shows where architectural choice points (CPs) were leveraged as part of these blended

professional activities. The table shows how LDs and project managers at the universities to a large extent operated as Blended Professionals during MOOC development. Those dimensions marked with a □ were identified through coding and analysis of the data generated in the case studies, with evidence of each identified in at least three separate instances at each university.

Taking on these dimensions of blended professional activity allowed LDs to wrangle with the diverse socio-technical demands of MOOC development. This section highlights such activity at each institution and, using findings from the STIN analysis, identifies points at which technological choices facilitate these activities within the third space.

Dimensions of Blended Professional activity at UA, UB, UC		Dimension	Choice point as part of blended activity
Spaces	Offer multiple understandings of the institution	□	
	Accommodate the ambiguities of *third space* between professional and academic domains	□	□
	Re-define, modify professional space and boundaries	□	□
	Work round formal structures	□	□
Knowledges	Embed and integrate professional and academic knowledge	□	□
	Undertake research into institutional activity		
	Create an interactive knowledge environment		
Relationships	Enter and understand academic discourse/ debate	□	
	Form alliances with key partners	□	□
	Facilitate autonomy of own staff	□	□
	Construct professional networks, internally and externally	□	
Legitimacies	Offer academic credentials	*	
	Achieve credibility in academic debate / space	□	□
	Challenge the status quo - manage the duality of 'belonging' and 'not belonging' to academic space	□	□

Table 14: Dimensions of Blended Professional activity at UA, UB and UC

The dimension related to academic credentials (marked *) has been flagged as although all of the MOOC team / LD participants in the study were qualified to Masters level, LDs felt that the key to achieving credibility with academics was through the interactions with educators, establishing strong relationships, and producing effective outcomes of which the educators approved. Indeed, LDs frequently emphasised that formal qualifications did not seem to be a factor in establishing their credibility as, for example, "no one has ever asked about my formal qualifications during my work" [UB_LD_05].

6.2.1 UA: Providing a service / controlling the process

As those involved at UA gained experience in this area of course creation, the reality of MOOC development as a complex, collaborative project became clear. As a result, the LD team shifted

their siloed position to a third space orientation, consolidating the LD role of 'controller' of the initiative (see section 5.6.2). A dedicated MOOC development team was established (outside of, but still linked to the TEL department). In contrast to the siloed approach outlined above, the team was able to operate "in the middle" of development activities [UA_ED_07], as the hub of a network of actors within the university and outside it (platform providers, video production). LDs were thus able to work more flexibly and responsively, establishing closer relationships with educators, media production, and legal professionals, and redefining "professional space and boundaries" as is characteristic of blended professionals (Whitchurch, 2009). Moving the LD role into the third space was necessary as the role "just touches on everything" [UA_LD_02] in a complex course production process. Working to minimize organizational and technological barriers to development activity, the MOOC team presented itself as a "service" in which they would offer to reduce the workload of educators and "just take all the crap off them" [UA_LD_01] so educators could focus on providing high quality content.

LDs used their third space position to redefine the educator role in course production. This 'service' approach entailed significantly unbundling the role in terms of Boyer's Teaching element of materials development and testing duties and changes to the collaborative aspect of the Boyer's Integration element of scholarly activities (1990). Development involved initial planning meetings between LDs and lead educators on courses to map out overall structure/possible content. However, subsequent involvement of educators was more limited, hinting at this unbundling of their role. For most courses, the revised educator role largely consisted of providing texts and images (with no element of task/activity design), in which "we just gave them Word documents and pictures " [UA_ED_07]. All educators at UA saw this kind of development activity as different from the greater depth of involvement in and control of materials selection and development on conventional courses. LDs also reported further adapting content materials to alter their length, complexity, or tone, a further layer of unbundling of educator roles in preparing instructional materials.

LDs also took the technological decision of denying educators access to the platform itself in order to ensure internal (marketing, legal) and external (platform provider) requirements for course materials were met. However, this also to some extent addressed educator concerns about the substantial workload attached to course development, meaning the LD team was perceived by educators as being "very supportive" [UA_ED_03], giving far more support than for conventional course development activities. This shows the LDs' awareness of "multiple understandings of the institution" and their ability to define their own and others' roles within the "ambiguities of third space between professional and academic domains" (Whitchurch, 2009).

6.2.2 UB: Brokering through technology

Similarly to UA, it became clear that MOOC development at UB required "a massive team effort" [UB_LD_04]. Existing structures and roles were proving cumbersome in relation to the competing external and internal demands affecting the projects. UB had chosen to develop courses in areas of the university's research strength, and use a course-based approach to development (with LDs based within subject areas). These strategic decisions produced unexpected consequences in terms of significant challenges in materials development and team working.

Although LDs at UB also moved into the third space, they developed the distinct 'broker' role (see section 5.6.2), acting as a hub and invoking different technological means to mediate between competing demands. LDs at UB attempted to influence educators' development activities by scaffolding their understanding of appropriate learning objectives and learning designs. Acting as blended professionals, LDs instituted a proxy platform (see 5.6.2.2) as a way of mediating between the "entrenched" [UB_LD_01] position of legal professionals on the one hand and educator preferences on selection and use of learning materials on the other. This "conscious decision to limit educator access to the platform" represented a renegotiation of institutional boundaries, and a blurring of professional and academic domains as seemingly peripheral actors (legal, marketing) exerted their influence. The LD remained central, with one LD insisting that educator input "is going to have to go through me" [UB_LD_01].

A similar technological choice involved LDs motivating the purchase of an institutional stock photography licence (see 5.6.3.4) which balanced competing demands of educators, marketing professionals and the platform provider. This allowed LDs to form effective networks between actors whilst being able to "enter and understand academic discourse/debate" (Whitchurch, 2009) relating to the authenticity and integrity of educational resources used. In balancing these competing concerns, obtaining this photographic resource provided images which were "acceptable from a scientific standpoint, but also met the glossy slick standards for putting … [the courses] out on a very public platform" [UB_LD_02]. These technological choice points identified in the STIN analysis also represent a blended professional renegotiation of institutional boundaries, blurring professional and academic domains.

The blended professional ability to "embed and integrate professional and academic knowledge" (Whitchurch, 2009) was crucial in helping LDs progress MOOC projects, but entailed an unbundling of the educator role in design and selection of learning materials, and of wider collaboration. Governance structures implemented at UB around MOOCs typically involved regular progress meetings with LD, legal, management, and marketing representatives (with educators frequently too busy to attend). As the "linchpin" of MOOC projects, LDs had to

understand and accommodate this range of competing interests whilst upholding the authenticity and academic integrity of course content for educators, and the technological and promotional interests of the platform provider. As at UA, balancing this range of demands entailed an unbundling of the educator role (perhaps tellingly educators rarely attended these progress meetings). As stated above, this unbundling as "sub-division of academic work into specialist functions" (Kinser, 2002) mainly centred on educator control over course design and content.

6.2.3 UC: Shaping outcomes through training

As mentioned previously, LDs at UC attempted to shape the outcomes of MOOC development by training educators in use of the platform and typical activity types. In this way, LDs took advantage of the "ambiguities of third space", redefining the roles of educators and their own. Importantly, they guided educators in an area of teaching (design of instructional materials) which is otherwise an identified aspect of educators' own scholarly activity (Boyer, 1990). In support of this guidance, LDs also constructed online support resources for educators which attempted to integrate and communicate the diverse elements of academic and professional knowledge required in MOOC development. This centralized approach to some extent unbundled more discipline-based teaching roles and resources, as the resource focused on the enabling and constraining effects of the shared MOOC platform.

Despite this emphasis on training of educators, STIN analysis clearly showed that LDs took up a hub-like role in development processes (see 5.6.3.1). LDs coordinated a range of actors, dealing with issues related to permitted use of resources, promotion of courses, and importantly video production. In their hub role, LDs liaised between video production teams and educators, constructing internal and external professional networks, as part of the relationship management role of blended professionals. Third space reconciliation processes of negotiation were enacted as LDs and video production teams encouraged educators to communicate their ideas in ways suited to the protocols of the platform provider and short video production more generally (see 5.3.3.2, 5.6.3.3). Once again, professional boundaries were challenged and redefined as educators had to adapt their conventional approaches to materials development in order to align with the priorities of a range of actors, both internal and external (Whitchurch, 2009).

However, the challenges of video production and time and budget constraints still caused tensions to emerge. At times, educators found video producers to be overly "perfectionist" [UC_ED_05] despite the "very very short time available to produce it [videos]" [UC_ED_04], whilst educators grappled with their existing workloads and commitments.

This unbundling of the educator materials development role as part of video production was also observed at UA and UB. Tensions and challenges emerged at all three institutions in respect to video production as requirements for this medium contrasted clearly with those of educational settings to which the educators were accustomed, as reported by both educators and LDs [e.g. UA_LD_01, UA_ED_02; UB_LD_01; UC_MGMT_02, UC_ED_04]. The unbundling occurs as key social actors (LD, video production staff, educators) interact with the learning design embedded in the MOOC platform and the underlying priorities of the institution (reputational enhancement and avoidance of reputational risk). Unbundling of educators' teaching materials development role occurs at various points in video production, including via adaptations to the initial script (and subsequent insistence on its use), direction during shooting, and (sometimes quite substantial) final editing of educator contributions [e.g. UB_LD_01; UC_LD_01].

6.3 Reconstruction: Consolidation of LDs as hubs and unbundling of educator roles

This section looks at the extent to which MOOC development exhibits a third space reconstruction phase involving "active participation of individuals toward the creation of a pluralistic environment in which new rules and resources are created in relation to the new space" (Whitchurch and Law, 2010). Though overlaps with the negotiation and critical exchange characteristics of the reconciliation phase may be present, firmer roles, networks and understandings of projects are more likely to be forged in this reconstruction phase.

In the first section, analysis of the case study data shows that consolidation of the LD as hub role is central in this reconstruction process. It is argued that by acting as blended professionals (as shown in Table 14), LDs are able to significantly shape MOOC development roles and processes. In responding to internal and external pressures and incentives (primarily of reputational enhancement and risk, as identified in the STIN analysis), LDs carve out a socio-technical third space which gives them a "final say" over many aspects of MOOC development.

The second section expands on this analysis of the reconstruction process, showing how LDs make use of technological choices to maintain control and consolidate their hub-like position amongst a range of seemingly peripheral actors. The analysis shows how LDs attempt to balance the demands and priorities of these peripheral actors, and in doing so unbundle some aspects of the teaching role of educators.

6.3.1 Consolidating the Learning Designer as Hub role: from co-creation to control

This comment from the head (an Educator) of the central MOOC team at UA illustrates well the sentiment which arose multiple times in relation to the reconstruction phase of MOOC development across the case sites:

"This project works best when a small, nimble team makes bold decisions. And just gets on with it." [UA_ED/MGMT_01]

Although surface level descriptions of MOOC development imply the need for a broad team effort, in-depth analysis of interview and documentary data reveal that LDs have a dominant role in the process in the reconstruction phase. Participants describe the overall development process as one of "team-based discussion" [UA_LD_01], with learning designers at each institution initially mentioning "co-creation" [UA_LD_02, UB_LD_04, UC_LD_03] in interviews. However, as more in-depth accounts unfold, indications emerge of indirect control where LDs "set expectations for what is and is not required" [UA_LD_01] from each participant. Indeed, documentation at UA and UB outlining the MOOC development process explicitly places LDs, not educators in decision-making roles at various mid- and late stages of course development. In addition, online course design guidance produced at UC sets out clear and fairly stringent guidelines for the main elements of course development (use of images, copyright, permitted activity types) which contrast with the impression of educator freedom given in some LD accounts at that institution. Further, at both UA and UB, LDs attempt to more directly influence the selection or style of course content, or decisions on activity design:

"We try to steer [educators] in the right direction" [UA_LD_02]

"I make sure I focus everyone's minds on […] three key aspects of learning design" [UB_LD_01]

This blended professional aspect of the LD activity (redefining roles, working round formal structures, integrating professional and academic knowledge), is also revealed in educator descriptions of the day-to-day development process. Here, educators see LDs as "co-ordinating" the projects, but at UA and UB educators were often only required to provide only fairly basic materials which the LDs could "organize themselves" [UB_ED_04]. This meant that educators had little involvement with the course "build" [UA_ED_07, UB_ED_06] and that LDs could "overrule" educators on a range of development decisions [UB_ED_05]. It also entailed a change in conceptions of ownership of course materials, as course materials were developed with the involvement of a range of actors (LDs, video producers, legal). Even though educators of course had input regarding academic accuracy of learning materials, the development and final form of materials could change significantly from that originally submitted by educators. At UC, educators

perhaps had more input on content and activities, but their work was still subject to extensive revision or even directly rejected by the LD in some cases [UC_LD_01]. At this point, the idea of indirect control can be further challenged by evidence of more direct control by LDs over MOOC development.

It is clear that what initially appears to be a "co-creation", or perhaps indirect control has distinct elements in which LDs retain a fundamental "final say" [UB_LD_04] or "final decision" [UA_LD_01; UC_LD_01]. For example, the LD as hub role extended to close involvement with higher level managerial oversight of projects. Strategic monitoring and control of MOOCs by upper management evolved with the projects, with all institutions reporting development of more "robust" [UA], "MOOC-specific" [UB], and "tight"[UC] processes of oversight.

However, these developments were informed at every stage by LD input, and the bulk of activity and everyday decision-making was undertaken as part of the LD as hub model across the sites. The fact that MOOCs don't fit within established university structures means that management have to "trust [LDs'] judgement day-to-day" [UA_ED/MGMT_01] on a range of issues. Here, LDs are clearly operating in a third space context which spans established organizational structures. This model emerged as a pragmatic reaction to "reflect the reality of making a course" [UA_ED/MGMT_01] which encompasses pressures and incentives from a number of internal and external sources. In coordinating these complex projects, LDs noted that they became "the single point" [UB_LD_03] of contact as established university structures simply did not account for the diverse needs and interests at play. This meant that LDs to some extent had "a very free hand" [UB_LD_01] in moulding course content and design.

Despite the degree of LD control of the space across which they worked, it is notable that the reconstruction phase was marked by somewhat conservative LD choices in course selection, design and refreshment processes. LDs in the initial contestation phase reported on their attempts to "resist a content push" approach [UB_LD_01] and experiment with course design in attempt to "push boundaries and do something that people hadn't done before" [UC_MGMT_02]. However, LD comments on the reconstruction phase revealed that they imposed numerous constraints on themselves and others in order to manage the aforementioned realities of MOOC development. The following section will show how LDs used organizational and technological means to define and interpret the third space in which they operated, whilst also balancing and constraining the competing interests and contributions of other actors involved with the projects.

6.3.2 Unbundling educator roles through socio-technical choices

In combination with organizational concerns, technological choices are implicated in the reconstruction phase in the ways LDs were able to consolidate their hub role and mediate the roles of others. As discussed in section 6.3, LDs were able to make technological choices in terms of restricting access to the platform, controlling use of resources and adapting and editing materials. This formed part of the efforts of LDs as blended professionals to satisfy competing demands for academic integrity, legal permissions, and reputational enhancement of the institution.

6.3.2.1 Roles and organization structures

Having negotiated between competing demands in the reconciliation phase, novel arrangements were established as new "rules and resources" (Whitchurch and Law, 2010) in the reconstruction phase. Expectations and working practices were set out at the start of new projects, with one LD making it clear that fundamental choices as to course content and structure "are going to have to go through me" [UB_LD_01]. LDs at all case sites developed methods of clearly delineating expected roles and responsibilities amongst the various social actors involved with MOOCs. For example, LDs worked with professionals in other departments (legal, librarians, educational resource curators) to manage and record use of resources, with LDs involved in monitoring and controlling images and texts used. This signalled a move away from some of the uncertainty and tensions over use of resources which marked the contestation phase. In video production, LDs were frequently fully involved in ensuring their vision for the course was realized, sometimes remaining "on site for every part of the shoot" [UB_LD_02], having to "edit [educator contributions] pretty hard" [UB_LD_01] or even remove their contributions if they didn't meet production standards [UC_LD_01].

The unbundling of educator roles was identified in the reconciliation section, and continued as new rules and resources were created within the pluralistic environment characterizing the reconstruction phase of third space activity. In terms of educator roles, the teaching and integration roles identified by Boyer (1990, 1996) were those affected, with unbundling occurring in Boyer's sub-activities of developing and testing instructional material (teaching role) and collaborating on course design/delivery (integration role) across the sample of educators at all sites. Educators at each case location conceded that LDs "very much managed the projects", whilst noting that working on other (online and face-to-face) courses differed from their MOOC work as "in other courses you are both creator and deliverer" of the materials [UA_ED_08]. After LDs had reconstructed the new third space (including socio-technical structures and processes for MOOC development) educator resistance to this unbundling was not identified as a significant

theme in the data, as opposed to in the contestation phase. Indeed, educators seemed prepared to accept the academic credibility and TEL know-how of LDs with little question, commenting that LDs "knew what they were doing" [UB_ED_06] or "know what they are doing with MOOCs" and that "we [educators] didn't" [UA_ED_07]. As mentioned in sections 6.1.1 and 7.3 above, LDs found that they could prove their credibility to educators via the work they did, the knowledge they displayed and the relationships they forged, rather than with reference to formal qualifications or publications [UA_LD_01, UB_LD_05, UC_LD_03].

LDs heavily constrained the materials development role of educators via the technological means (actants) mentioned in section 5.6 and 7.3. This was partly motivated by the involvement of the seemingly peripheral actors (legal, marketing, video production, platform provider) identified in the STIN analysis (section 6.1). For example, LDs worked across organizational boundaries to liaise with those responsible for checking the acceptability of resources used on the course (legal professionals, librarians etc). Together with these peripheral actors, they managed through social and technical means to "standardize" [UB_LEG] these procedures and in so doing, unbundle the role of educators in materials selection. LDs often took an active role in the selection of 'compromise' material when tensions emerged, revealing that this standardization in practice meant removing or diminishing the materials selection aspect of the educator role. Such compromises embodied concern over meeting development deadlines alongside the conditions of legal agreements or marketing quality standards. The compromises also showed a change in the conception of who controls or 'owns' learning materials produced in universities. Educators felt far more control and ownership over materials produced in conventional courses than those in MOOCs, from which they were distanced both by the organizational structures involved, development processes and technologies used.

6.4 Chapter summary

This section reported on and evaluated the extent to which the "dynamics of third space environments" influenced the development of MOOCs, with particular reference to the roles of educators and learning designers. The analysis integrated the findings of the STIN strategy, in order to add a nuanced, socio-technical element to understandings of third space activity in HE. As predicted in third space theory, the initial phases of MOOC development were marked by adherence to existing university structures, processes, and roles, leading to tensions and conflict (contestation) as the complexity of the projects became apparent. These tensions were intensified by the institutional motivation for reputational enhancement (and consequent reputational risk) underlying these massive, online projects. It is notable that UC exhibited these

tensions to a lesser extent, having already established some procedures for producing comparable online learning initiatives.

As the lack of fit between MOOCs and the universities' structures manifested more clearly, reconciliation processes of negotiation and critical exchange occurred between social actors involved. LDs began to fashion their hub role in order to manage and control the diverse and sometimes conflicting demands of actors and actants both internal and external to the universities. Although particular realisations of the hub role differed across the sites, the overall function and position within MOOC projects was relatively consistent, and was substantially shaped by LDs themselves. They did this by leveraging opportunities to shape their roles within the ambiguity of the third space via blended professional dimensions of activity - interpreting their own roles and those of others, establishing networks of relationships, whilst also demonstrating their academic, professional and technological credibility and knowledge.

However, the STIN analysis adds depth to this understanding in demonstrating how technological choices and structures became intertwined with organizational ones as part of these blended professional activities. Socio-technical choices (limitations on access to the platform, configuration of a proxy platform, control over educator contributions through editing, application of video production values, use of third party image repositories) are implicated in the unbundling of educator roles in MOOC development, challenging established notions of educator control over course materials in course production. This enhanced understanding of educator and learning designer roles is enabled by demonstrating how the context of MOOC development is one of a 'socio-technical third space' in which both social and technical factors interact to shape roles, organizational structures and the courses produced.

After a period of negotiation, the reconstruction phase of third space activity emerged. Analysis of the case study data revealed that, in line with third space theory, a new space and set of rules and resources was indeed established, to which various social actors actively contributed. Further drawing on skills as blended professionals, LDs were able to operate across conventional university boundaries and structures in establishing this socio-technical third space in which the 'realities' of MOOC development could be accommodated. LDs continued to operate as hubs in the socio-technical network of MOOC development, having made technological choices on access to and configuration of technologies and thus access to and control over the learning materials created and the process of creation.

The transition of MOOC projects through contestation, reconciliation and reconstruction phases is illustrated in Figure 16 below. The figure shows how LDs operated as hubs in a third space context between professional and academic domains, using their skills as blended professionals to shape

development processes and the roles of others. The diagram helps depict how LDs do indeed operate in a third space context during MOOC projects (as previous studies of non-MOOC online learning would predict). Importantly however, the diagram also acknowledges socio-technical interactions with the technologies which are the raison d'être of online learning projects. The findings suggest, therefore, that understandings of third space and the roles of those operating within them can be extended by acknowledging that technologies have a role within the space, and indeed are inseparable from this socio-technical third space.

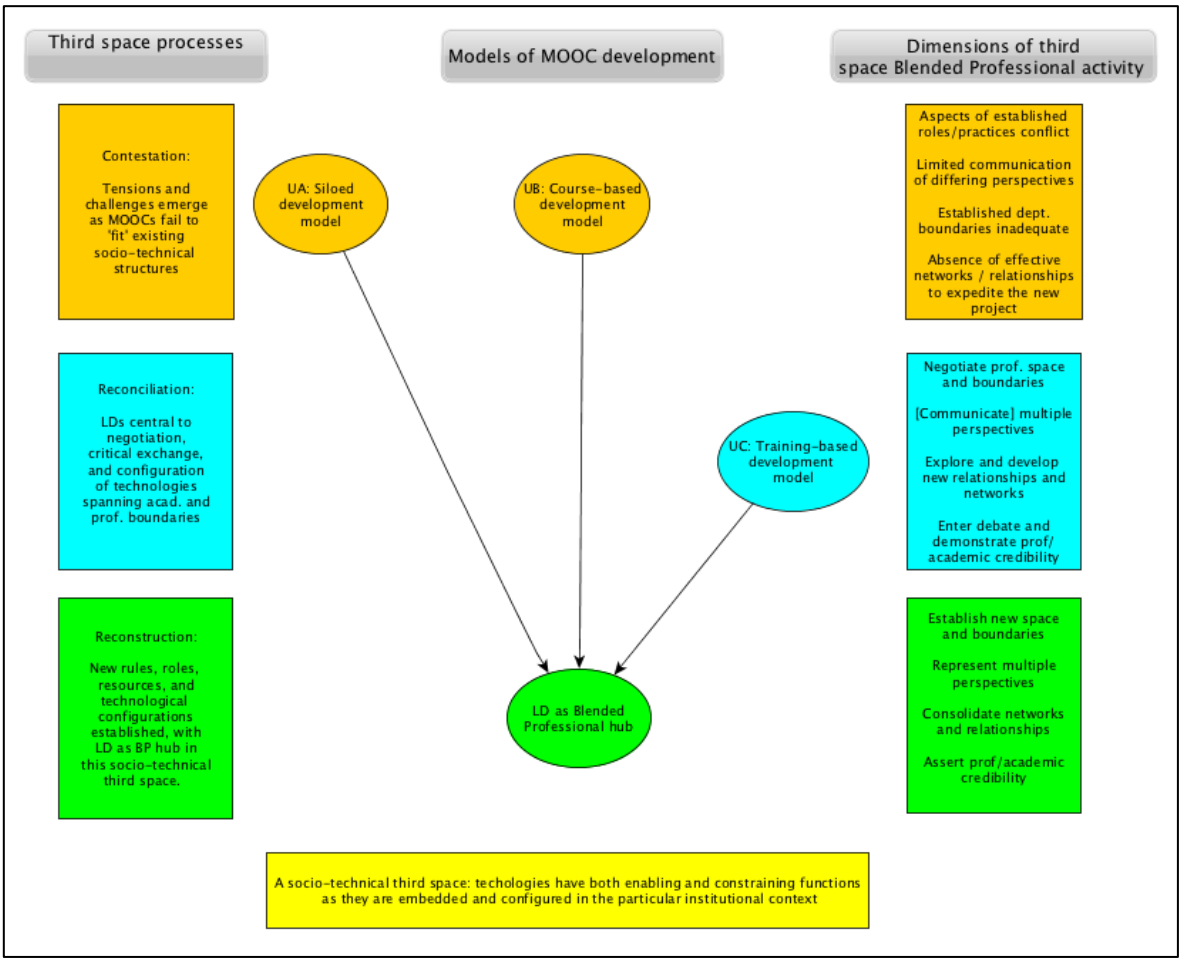

Figure 16: Learning designers as blended professional hubs in a socio-technical third space

Beneath narratives of 'co-creation' and 'teamwork' in participant accounts, the analysis revealed a large degree of LD control over MOOC development in some respects as they operate as blended professional hubs in a socio-technical third space. Although educators of course maintained substantial input into the subject content of courses (with UC giving greater control than the other sites in activity design also), they nevertheless reported having far less control over development processes and end products than during conventional course production (online or face-to-face). LDs found it necessary to establish this control in order to manage the complexity of the projects, and balance the diverse and sometimes conflicting interests of other actors internal

and external to the university. LDs in fact had a ‘final say’ over many aspects of MOOC development, and control was exercised via both organizational and technological means, which were often intertwined, and facilitated by the flexibility inherent in operating in a socio-technical third space context.

Chapter 7: Findings 3: Perceived influence on wider educator practices, limited corroboration

Findings sections one and two examined in depth the complex socio-technical networks which develop around MOOC development and implementation, and the way in which learning designers interact with technology to shape these networks within a third space.

This section considers the practices of educators more widely in addressing research question three:

How do educators perceive the influence of MOOC development on their wider practices, and what documentary evidence is there to support this perception?

This section reports on the extent to which educators perceive that participation in MOOC projects influences their wider practices outside of MOOC production activity. As discussed in section 2.2.3, practices are understood as 'routinised behaviour' in this thesis. The analysis draws on the four categories of scholarly activity as identified by Boyer (1990, 1996) as a means to conceptualize scholarly practices and the possible impact on them resulting from educator participation in MOOC development. These categories of scholarly activity are discussed in section 2.15 and are identified as teaching, discovery, integration and application. The analysis shows that educators perceived the most notable influences on their wider practices to be in the areas of teaching and application in terms of:

1. Linking application and teaching activities
2. Essentialising content in non-MOOC teaching

Each will be discussed in turn in this section.

The findings also consider the depth of evidence for this perceived influence when cross referencing participant accounts with other corroborating data (other participant accounts, document analysis).

7.1 Engaging with and learning from the public

By participating in MOOC projects, educators were to some extent able to link Boyer's application element of their practices to their wider teaching work. Educators perceived that participation in MOOC development allowed them to engage with the public and enrich their ability to teach and communicate their subjects. In applying Boyer's categorizations to the use of digital technology, Weller (2011, p.76) interprets Boyer's concept of application as 'engagement', using HEFCE's description of scholarly activity involving "listening to, developing their understanding of, and interacting with non-specialists". Interpreting application as engagement in this way, analysis of educator interview data showed that engagement was widely cited by educators as a motivation and outcome of their work with MOOCs. MOOCs were seen as a "new way for the university to have a role in public life" [UB_ED_01], a kind of "public service" [UA_ED_01] or a "way to engage the public" [UC_ED_01].

Conventional understandings of application-type activity were also common, with MOOCs being seen as a way to "spread the word" about particular research areas [UB_ED_04] or represent universities as "thought leaders" [UB_ED_03]. Significantly, however, comments or feedback provided by MOOC participants were highlighted across the sample of educators as useful sources of information about wider public understandings of and attitudes to specialist topics. It was felt that educators and researchers could "mine [MOOCs] … for insight into the kind of comments and reactions they get" [UA_ED/MGMT_01], and enrich their understandings from participating in a "big conversation" as part of a kind of "corporate social responsibility" [UB_ED_03]. Educators perceived this kind of activity to have implications for their further application (engagement) and teaching practices.

Interestingly, applying Boyer's categorisations of scholarship to educator participation in MOOC development provides a challenge to established understandings of the relations between the four elements of Boyer's scholarship model. As discussed in 2.15 ('Boyer and scholarly practices') previous conceptions of scholarly activity (in Boshier's 2009 interpretation of Boyer's work) place application activity as separate from the overall context of teaching. This contrasts with discovery and integration functions, which are seen to occur within the context of teaching activities, as shown in see Figure 4 (section 2.15).

The technical realizations of MOOCs at the case universities, which allow large-scale public participation and communication, have helped to bring application activities (such as engagement) within the context of teaching, rather than remaining separate from it. In contrast to open lectures, public speaking, or other outreach activities, MOOCs have allowed educators to conduct engagement activities within a structured, interactive course environment. This provides

the opportunity for educators to interact with, and "develop their understanding of non-specialists" through listening and interaction as defined by HEFCE above. Educators anticipate being able to "mine" [UA_ED/MGMT_01] these understandings of the way the public sees their work to inform both future open courses [UA_ED_06] and their own conventional university teaching [UA_ED_02; UB_ED_02, ED_03; UC_ED_04]. Figure 17 shows an adaptation of Boshier's (2009) representation of Boyer's model (see Figure 4), demonstrating how application activity has been brought partially within the wider teaching context of Boyer's categories.

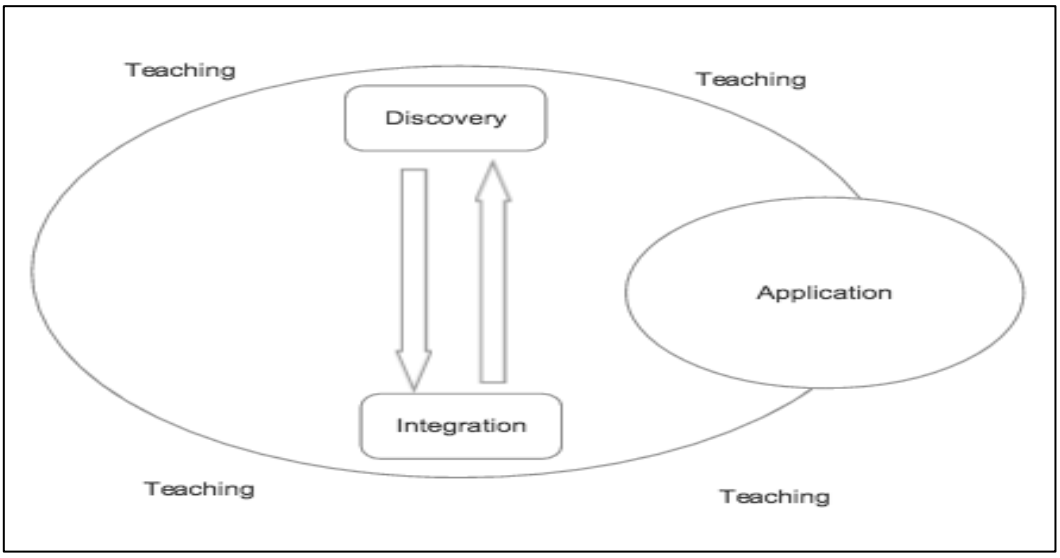

Figure 17: Movement of application activity towards the teaching context, adapting Boshier's (2009) representation

Despite this notional move of Boyer's concept of application into the sphere of teaching activity, wider analysis of interview accounts and documentary data reveals little evidence of any systematic use of participant comments or course activity data in conventional teaching. Closer inspection of educator accounts reveals that many references to participant comments or feedback merely show educators' appreciation for the "warm" [UB_ED_06], "incredible" [UA_ED_06] or "positive" [UA_ED_02; UC_ED_05] feedback provided. This "lovely anecdotal feedback" [UA_ED/MGMT_01] provides positive reinforcement for the effort educators devote to MOOC production, but does not constitute evidence of wider changes in practice in this area of activity. However, the example of embedding MOOCs in conventional courses does provide some evidence of at least short-term changes.

7.2 Embedding MOOCs in face-to-face courses

The most striking examples of bringing application and teaching activities together occurred within the institution at UB, and externally to the institution at UC. At UB, MOOCs were

'embedded' into some conventional, face-to-face university course modules. Four of the six educators at UB were involved to some extent in this embedding (concerning 3 different modules). The embedding involved encouraging conventional students to interact on discussion forums on particular topics in their credit-bearing courses (which crossed over in some ways with their own units), and in one case producing content which would be evaluated by MOOC users, again as part of the for-credit module. Though this clearly constituted an impact on the wider practices of educators in the short-term (during those particular modules), all the educators involved were pessimistic about the medium to long-term viability of such projects. Challenges of integrating course requirements and materials, and of the time available to organize embedded courses were deemed to be significant, and likely too substantial to encourage wider rollout of such practices as routinised behaviour in future years.

At UC, one of the courses became part of a parallel community outreach project, in which an existing MOOC was offered in tandem with face-to-face elements of the course, using the same or very similar content. Interestingly, this blended MOOC and face-to-face model of provision is intended to be "credit bearing" [UC_ED_03]. The course represents an extension of existing outreach work in which the educator already participated, but was seen as an exciting way to experiment with delivery of new types of courses to participants who previously had little access to or contact with higher education. The course was still being planned at the time of the research, so in-depth analysis or educator reflection on its impact on practice was not possible, however.

No similar initiatives were reported at UA.

7.3 Teaching: essentialising messages in conventional teaching

Educators frequently cited working with MOOCs as an influence on their teaching practices, though there is limited corroborating evidence of this outside of individual educator accounts. A variety of influences on educator practices were mentioned, though few consistent patterns or themes emerged from the data. The following list outlines aspects of wider academic work related to teaching which educators perceived to have been influenced by participation in MOOCs:

1. Use of novel technologies in conventional teaching (screencasts, videos, or interactive tools) [n=4]
2. Development of online or blended courses (distinct from MOOC projects) [n=5]
3. Reuse of digital materials used in / produced for MOOCs [n=4]

4. Increased awareness of open access materials available on the Web [n=1]

However, these themes were not identified consistently across the samples either within or across the case sites. Further, corroborating evidence of their use was hard to find. On closer examination, many of these activities were in fact plans or intentions rather than established routinised practices.

The drive to 'essentialise' content in conventional teaching activities did emerge as a more consistent theme in educator accounts. The specific term 'essentialise' was used by one of the educators [UB_ED_05], but the underlying meaning could be identified in educator accounts across the cases. Indeed, educators frequently mentioned focusing on particular "key ideas", a "central message", or "story" which formed the core of their thinking and planning for educational interventions of various kinds. In all such accounts, the idea of 'essentialising' can be understood as an imperative to focus in each teaching session on a core message, and key supporting ideas or concepts in a given subject, and communicate them very concisely and simply. This method of concise focus on a particular core message or "story" was seen by educators as distinct from their communications in conventional lectures or seminars [UA_ED/MGMT_01, ED_02; UB_ED_04, 05, 06; UC_ED_02, 04,05]. However, they frequently cited this ability to "roundup" ideas [UB_ED_03] as something which subsequently informed their approach to planning and delivery of teaching in conventional educational settings. Indeed, an educator at UA commented that:

> "all of our MOOC educators … all of them would say they've learned quite a lot from [MOOC development] about self presentation, how you work on video and how you chunk messages down into bite sizes" [UA_ED/MGMT_01]

Educators first confront this aspect of communication mainly as a result of participating in the development of video resources for MOOCs, which brings them into direct contact with LDs and wider teams of video production specialists. Both LDs and video producers bring with them guidelines or priorities to guide educator video contributions in terms of platform requirements, perceptions of student preferences for consumption of video and of broader video production values. These "short sharp" [UA_ED_02] core messages in videos will become part of a wider, but focused 'story' of the overall MOOC, as outlined in guidance documents provided by the platform provider.

7.4 Understanding the value of essentialising messages

According to the educators, understanding the value of 'essentialising' led to changes in the ways they plan and deliver face-to-face content. This is evidenced by one educator [UB_ED_06] who made "10-minute or more often 15-minute summary videos, revision videos" to support conventional course teaching for one unit. This was seen as their "baby step this year" toward a change in practice, using relatively simple, existing university lecture capture technology to help students review important course materials before exams. Other educators [UA_ED2, ED3, ED9; UB_ED5; UC_ED_02, 05] describe MOOCs as initiating greater reflection on the content of their face-to-face lectures, and a drive to focus on particular key points, leaving more time for discussion or tasks. Educators across the cases also reported that the process initiated greater reflection on the potential value of using video in their conventional teaching.

7.5 Limited evidence of changes in teaching practices

It should be noted, however, that despite frequent mentions of this idea across the educator interviews, few substantive examples of changes in teaching practices, let alone changes which amounted to "routinised behavior" could be evidenced. Only one educator across all samples [UB_ED_06] could highlight documentary evidence (such as course documentation or videos produced), and none could provide anecdotal examples of any changes in their teaching practices when pressed during interviews.

Though educators mentioned a desire to use more video in conventional teaching they reported a lack of time available to adapt materials or methods from MOOCs to their wider work. As reported in section 5.5, MOOC development activity (of the high-profile, x-MOOC-type used at the case sites) is time and resource intensive, and demands a range of technical and professional expertise. In order to implement the priorities and preferences of LDs and platform providers, professional video production units were often used. Indeed, one educator reported MOOC production involved "increasingly high production values around videos and animations" which created high quality video but which "cost a lot" [UA_ED/MGMT_01] as projects progressed. Other educators [UC_ED_02] highlighted the length of time video production requires, noting "just how long it takes to film a 3-5 minute video" [UA_ED_02], notwithstanding the fact that educators were not involved in extensive editing of videos after filming was complete. This means that the techniques and production standards which educators experienced were not readily transferable to the more individualistic course development practices used for conventional courses. The STIN analysis shows the substantial amounts of time, material resources, and complex organisational relationships required to create these kinds of MOOCs.

As noted at the end of the STIN analysis (section 5.7.3), two educators [UA_ED/MGMT_01, ED_02] retained control over particular technologies used in their MOOC courses (by using 'off-platform' applications). This resulted in a less extensive unbundling of their role as they were able to communicate directly with representatives of the platform provider on technical matters and determine the activity types used, to some extent bypassing the mediating LD as hub role. These educators did introduce more routinised changes into their conventional teaching practices, reporting regular use of adapted MOOC resources in their conventional course teaching. UA_ED/MGMT_01 reports that "the digital resources … all of that stuff will have a second life as teaching resources in my day-to-day work and as departmental resources". UA_ED_2 also reports developing web-based resources for the MOOC which were adapted and "went into first year courses" and "shall certainly be using the material" in conventional courses the following year. However, it is perhaps relevant that these educators were already using similar resources before the MOOC initiatives, so brought with them some of these skills. Rather than the MOOC serving as the initial catalyst, these educators made efficient re-use of MOOC resources, drawing on previous experience to see where they could be applied, and adapted and re-applied.

In the cases where educators did apply MOOC-related technologies in their wider practices above, they both had direct involvement with and control over the technologies they used. In contrast, the inter-connected LD as hub role (whether as controller, broker or trainer) and unbundling of educator teaching role outlined in section 6.4.2 served to 'distance' other educators from the technologies used to create the learning and teaching element of MOOCs.

The STIN analysis highlighted the production procedures for educators in MOOC projects: At UA educators mainly produced Word documents on agreed sequences of topics. At UB educators uploaded texts or activities to a simple proxy blogging site (which were then transformed into learning activities), and at UC educators were trained to produce fairly simple texts and activities which were then often substantially edited and revised by LDs. During video production at all sites, educators had little involvement in technical aspects of video production, and content was substantially shaped and directed by the LDs and production teams to align with the production values of the platform.

As a result of these organizational structures and production techniques, it seems that educators had limited exposure to practical techniques or experiences which could be transferred to the more individualistic context of conventional course teaching.

7.6 Research as discovery, and publishing on MOOCs

There was little consensus on the relevance of working on MOOC projects to the 'discovery' element of educators' wider working practices (publishing in peer reviewed journals, producing/performing creative work, or creating infrastructure for studies). This lack of consensus could be seen in discussions of whether MOOC work is directly relevant to research activity in performance appraisals, including to underlying considerations such as producing publications relevant to the Research Excellent Framework (REF). For example, at UB some educators felt that those appraising their work would have no interest in their participation in MOOC projects [UB_ED_02, 03], even to the extent that it might be seen "as a negative thing" which detracts from work in other more valuable areas (of conventional research).

However, others in different departments within the same institution "made sure it went onto [their] appraisal form", feeling that the institution valued participation in MOOC initiatives, even perceiving it to be an advantage in opportunities for promotion [UB_ED_04]. Some participants were able to highlight academic publications linked to MOOCs as more concrete outcomes from their involvement in project. Overall, no clear theme was identified in the data across the institutions on the overall relevance or importance of MOOCs in educators' discovery practices. It was not possible to identify any routinised behaviour in relation to discovery-type educator practices.

References to the REF were common in educator comments related to the discovery element of their work. Most participants (across the categories of educators, LDs, and management actors) reported that the relationship between MOOCs and the REF was unclear. A few educators felt strongly that MOOCs were not relevant, arguing that

"a MOOC is not going to feed into the REF … unless you are researching MOOCs, it's very hard to say that the work of the MOOC is in any way going to, uhm, lead to good quality research outputs" [UB_ED_03].

The majority were uncertain, however, noting that at both educator and institutional levels, they were "not sure how it will relate to the REF" [UA_ED_06], or whether MOOC-related activity would constitute "dissemination" rather than impact [UB_ED_05]. Impact case studies linked to MOOCs were mentioned at each institution, but no work was under way on them at the time of the study - it was only reported that discussions were undertaken on whether MOOCs might be a suitable part of case studies. Educators at University A produced the most publications linked to their involvement in MOOC projects, with 60% of those interviewed named as an author on at least one academic paper relating to MOOCs. Educators at UB and UC had not been involved with

academic papers relating to MOOCs, though many had made reference to them in conference presentations. No particular pattern or indicator was found to suggest why educators at UA had published more than at other institutions, and limitations in the sample size and sampling technique in any case means that drawing any conclusions from quantitative data in this sense would not be meaningful.

7.7 Chapter summary

This section reported on and evaluated the extent to which educators perceived an influence on their wider practices resulting from involvement in MOOC development, using Boyer's categories of scholarly activity as a way to conceptualize these wider practices.

The findings show that educators did indeed perceive influences on their wider practices as a result of working on MOOC projects in the following areas:

1) Linking application and teaching activities
2) Essentialising content in non-MOOC teaching

An important factor limiting the influence of MOOCs on educator practices, identified in the STIN analysis, is the way the complexity, time- and resource-intensiveness of MOOCs limit the potential for educators to apply MOOC-related practices more widely in their work. The STIN analysis shows the substantial amounts of time, material resources, and complex organisational relationships (see Figure 5) required to create this kind of MOOC. This contrasts starkly with the "fast, cheap and out-of-control" (Weller, 2011, p.10) Web 2.0 technologies which Weller sees as influences on all categories of Boyer's scholarship. None of the interview accounts, documentary analysis or observational data reflected any sense of MOOCs having these cheap, fast or out-of-control characteristics – least so in regard to the legal limitations associated with MOOC development.

This perhaps explains why overall, no clear consensus on the influence of MOOCs on research and the REF could be identified within or across cases.

It is also possible that the unbundling of educator roles reported in section 6.4.2 means that educators have less exposure to new technologies and techniques - certainly at UA and UB at least. As educators become to some extent excluded from the technologies which form the technological basis of courses (see section 5.6.2.2) it is perhaps not surprising that they do not engage with or adapt such technologies in their wider practices. No clear consensus on the influence of MOOCs on research and the REF could be identified within or across cases.

Chapter 8: Discussion

This chapter discusses the findings of the research in relation to current knowledge in the field in order to evaluate its contribution to knowledge. First, section 8.2 highlights how the results of the STIN analysis highlight the institutional motivations underlying MOOC development, producing novel socio-technical arrangements for course production which challenge conventional understandings of teamwork in online learning projects (RQ1). Next, the discussion in 8.3 shows how the LD as hub role provides an insight into the distinctive role of LDs as they negotiate the development of courses with massive and open elements. Further, viewing LD activity through a third space lens (section 8.4) adds nuance to analysis of this activity, producing an understanding of MOOC LDs as blended professional hubs who are able to define and shape the roles and contributions of others, to the extent that they have an unspoken "final say" over many aspects of course development.

Section 8.4 also highlights the value of bringing together STIN and third space perspectives in research into online learning, confirming the Social Informatics principle that the social and technical aspects of embedding technology into organizational contexts are not separable. One result of this synthesis of perspectives in the research is the insight provided into the ways social and technological means are used to unbundle educator roles in MOOC development in section 8.5. The discussion of unbundling highlights how this study provides empirical data on a much discussed yet under-researched phenomenon.

Section 8.6 considers the limited insights which were produced in relation to influences on wider educator practices. The final section (8.7) reviews the potential for a socio-technical third space analytical approach to inform research into inter-professional practice (IPP), an area which shares a concern with massification and the 'blurring of boundaries' in HE.

8.1 Strategic aims and unexpected consequences

The literature shows that at the time of this study, MOOCs were widely portrayed in popular media and grey literature sources as an irresistible technological wave of change, set to transform both access to education and teaching methods in HE. More sceptical accounts could of course be found among online and distance learning researchers. In line with previous studies into the drivers of MOOC development (Davis et al., 2014), this study found that the high profile nature of these courses, with consequent potential for reputational enhancement of the institution was a

strong factor motivating participation at each of the universities. Though these drivers evolved over time (with a growing focus on credit-bearing or CPD-oriented courses), a commercially focused intent persists relating to marketing of courses, institutional reputation and recruitment of students (Brown, 2018).

However, these high profile initiatives also entailed reputational risk for the institutions, as confirmed in recent work by León-Urrutia et al. (2018). The realities of embedding such complex courses into university organizational structures thus had unexpected consequences for the roles and practices of those involved with them. Daniel's claim that MOOCs fail to align fully with conventional HE functions of teaching, research and service (2014) is relevant here, as established roles of educators in the study were found to be ill-suited to the needs of MOOC development. Indeed, contractual agreements between universities and platform providers produced particular demands regarding course content (copyright, quality, branding) and accessibility which educators struggled to accommodate using established course development practices.

8.1.1 Novel legal and commercial imperatives influence course development

Struggles over content and accessibility are perhaps emblematic of one way in which HE institutions are attempting to redefine their role in the modern era. It is argued that this process of "reorientation, reconstitution and redefinition" (Selwyn, 2017, p. 15) is a response to developments in Web technologies (Siemens, 2013) on the one hand, and wider social, political and economic shifts towards massification and commodification of HE on the other (Selwyn, 2017). MOOCs are a manifestation of these shifts, especially in terms of their potential for openness and scalability, something which Czerniewicz et al. (2016) link to emergence of tensions and constraints in MOOC development. This study has shown how accommodating these high profile, massive, open courses in partnership with an external platform provider entails novel legal and commercial imperatives which are relatively alien to typical (pre-MOOC) HE educational course offerings, whether face-to-face or online. In this context, the emergence of LD positions which blend professional and academic roles (Whitchurch, 2010) is understandable, as extant organizational structures and roles must adapt to accommodate these novel demands within course offerings.

Educators in this study were unused to constructing learning materials under various copyright, marketing or accessibility restrictions and consequently the need arose for a (LD) role which could mediate between a range of perspectives both internal and external to the institution. In line with previous commentary in non-MOOC online learning literature on the ability of LDs to understand broader institutional perspectives and priorities (Akella, 2015, Campbell et al., 2009), LDs were

well aware of the promotional intent underlying MOOCs and sought to balance this aim with the particular interests of other social actors (such as educators or legal representatives), and the technical affordances of the platform. This finding provides partial empirical support for Margaryan et al.'s (2015) speculation that centralized, standardized MOOC learning designs result from the dominance of institutional marketing concerns over the course development process.

However, this thesis identifies a broader range of socio-technical factors which shape MOOCs and the roles of those who produce them in complex, co-constructive ways. The aim of reputational enhancement (and attendant threat of reputational risk) can be linked to a range of social actors, their interactions, and the technologies used to facilitate these aims. Though resources and course design activity are concentrated on a central platform, the activities of LDs and the networks they navigate are certainly not centralized (as will be discussed further in section 8.4.5). This finding could be used to inform planning for online course development in aligning overarching institutional aims with effective course development structures and roles.

8.1.2 Interaction of platform design and institutional priorities in shaping MOOCs

In addition to promotional and marketing concerns, the literature also indicates that platform affordances significantly shape the form of MOOC designs produced (Laurillard, 2016). Laurillard does not present evidence to support the claim that "technologists" (rather than educators) dictate platform capabilities and thus platform use which in turn diminishes the pedagogical potential of MOOCs (2016, p.6). However, the concern is a legitimate one, especially in light of Margaryan et al.'s empirical findings related to the poor pedagogic quality of xMOOCs. This thesis has shown that initially LDs may attempt creative or pedagogically ambitious learning designs in MOOCs. However, at each of the case sites, the weight of socio-technical pressures both internal and external to the institution on the course development process can ultimately lead to somewhat conservative designs which rely on high quality video and basic platform capabilities.

The STIN analysis certainly identified platform design as a significant factor in MOOC development, but using this as unqualified support for Laurillard's position would be to misrepresent the nuances of the analysis. An important argument in this thesis is that it is not just the platform design which determines the courses produced, but complex socio-technical arrangements which shape and balance technological capabilities, competing interests, priorities and demands for resources. Thus, differing strategic choices of the subject areas in which to produce MOOCs resulted in significant differences in the universities' development processes and the roles of their educators and LDs in the study. Restrictions on use of materials related to the

platform design influenced but did not determine social arrangements on MOOC production or the form of MOOCs produced in the cases. In this sense, this thesis adds to the Social Informatics literature rejecting "simplistic, deterministic arguments" of both social or technological determinist positions (Sanfillippo and Fischman, 2013, p.9), and to the rejection of determinism outlined in studies of TEL in the UK (Oliver, 2011) as the following discussion of LDs as hubs in a socio-technical network will further demonstrate.

8.2 Learning designers as hubs in a socio-technical network

8.2.1 Accommodating distinctive institutional aims and distinctive technologies leads to socio-technical construction of distinctive roles

As discussed above, MOOC development initiatives at the universities were distinctive from other HE course development activities in significant ways. The aims of course development were intertwined with a range of internal and external contextual drivers, and the potential for openness and scalability of MOOCs both motivated engagement with them and entailed a lack of fit with established university functions. These findings help to explain the discomfort experienced by educators involved in Zheng et al.'s study of MOOC development, who experienced conflict and tensions, ultimately realizing that "teaching on a MOOC is totally different from teaching regular college classes" (2016, p.216). In these circumstances, it is unsurprising that the STIN analytic strategy revealed challenges to established professional and academic roles. The findings of this analysis broadly confirm the underlying themes prominent in Social Informatics research: that technologies (MOOC-related technologies in this case) are embedded, configurable and have enabling and constraining effects (Kling et al., 2005) in their social context of use. These themes are discussed further below.

The most striking outcome of the analysis was perhaps the emergence of LDs in a hub-like role, embedding MOOC development in each context within the assemblage of "people, documents, legal arrangements, enforcement mechanisms and resource flows" which Kling et al. (2003, p.48) characterize as a socio-technical interaction network. This confirms initial indications of the positioning of the LD role identified in the preliminary stages of this thesis (White and White, 2016a). Despite references in some participant accounts to MOOC development as a 'team effort' or process of 'co-creation', in-depth analysis of participant accounts and course development documents clearly indicated that LDs occupied a significant position in course development. This position of significance was partially achieved by configuring technologies (e.g. access to the platform or proxy platforms) to constrain the activity of some actors (e.g. educators) whilst enabling those of others (LDs, legal or marketing representatives etc). Participant descriptions of

the LD 'fulcrum' or 'linchpin' role echo claims from much earlier studies of educational technologist roles which identified their "pivotal" position in educational technology initiatives (Beetham et al., 2001) or their project management function. However, this study adds depth to this understanding of LD roles in identifying the range of seemingly peripheral actors with whom they interact and highlighting their importance in MOOC development initiatives.

8.2.2 Revealing the significance of seemingly peripheral actors

The findings of this study add a socio-technical dimension to existing accounts of LD and educator roles and relationships in the literature. Previous studies of non-MOOC online learning depict relatively well-defined, centralized team roles (Caplan, 2008), focus on skills or values which underpin the roles (Beetham et al., 2001) or discuss how the roles are socially negotiated (Oliver, 2002, Keppell, 2007, Cowie and Nichols, 2010). This thesis builds on the fundamental understanding that the social structures and technological elements of educational technology initiatives are socio-technically co-constructed in networks of relations within their particular context, drawing on established principles from Social Informatics and the STIN analytic strategy to do so. The findings reveal that the LD as hub role in MOOCs operates not solely in negotiation with educators (the focus of the above studies by Keppell, and Cowie and Nichols) but via interactions with technologies and a range of seemingly peripheral actors who represent different perspectives on institutional priorities for the project.

Indeed, previous research has listed the roles or functions of a range of actors who may be involved in online course development (Caplan, 2008), touching on legal or marketing functions, but lacks a focus on how such wider roles are negotiated or intertwine with technology, and in any case pre-dates MOOCs. In fact, relevant social actors in MOOC development (such as platform representatives or media producers) may even be external to the university, and yet have substantial input into development processes. In line with findings from Social Informatics studies in commercial organizational contexts (Eschenfelder and Chase, 2002), this study has confirmed that where a new technology is introduced, these seemingly peripheral social actors can significantly shape roles, processes and procedures within MOOC development networks. This is a potentially valuable insight for those involved with the planning and development of online learning initiatives (especially MOOCs) at both strategic and operational levels.

8.2.3 Leveraging system architectural choice points to shape roles and outcomes

In addition, the STIN analysis was able to highlight how LDs leverage system architectural choice points to shape the roles of those involved in development, influence the content of courses

produced and respond to internal and external incentives and pressures (such as legal, marketing or media production requirements). LDs made crucial system choices, controlling levels of educator access to the MOOC platform (in two of the three cases educators had no direct access to course materials on the platform), and directing training of educators where they often determined and monitored the types of technology available and appropriate uses of it. Such technological choices were motivated by educational concerns (including controlling the type, quality and consistency of output), more strategic priorities (ensuring adherence to contractual obligations or marketing standards, and limiting reputational risk to the institution) or pragmatic ones (meeting deadlines, solving disputes). This provides empirical support for, but also elaborates on Oliver's claim that learning technologists rely on their "expertise" to "create opportunities (both practical and educational)" (2002, p.248). This study has shown how the application of a socio-technical lens to research into educator and learning designer roles and practices provides a richer, socio-technical understanding of this idea of "expertise".

The development of this expertise does not occur as a natural or inevitable outcome of technology use as might be suggested in more technologically determinist accounts (such as Sharrock, 2017 on MOOC development in HE). Rather, the findings of this study support Oliver's contention that social actors "must make efforts to make sense of [technologies], work them into our social practice and through doing so remake them" (Oliver, 2002, p.410). This point of view more accurately reflects the findings of this study and the assumption underlying Social Informatics research that technology becomes and embedded and indeed co-constructed in its context of use.

In this thesis, part of the 'expertise' to which Oliver refers is not just technical know-how. Expertise is also required in interacting with and applying technologies to help shape organizational arrangements, the roles of those within them, and the content and form of courses produced. In the case sites, LDs sought to embed MOOCs into the institutional context in ways which promoted particular interests or priorities (such as configuring platform access to control content or ameliorate copyright concerns). This illustrates principles of Social Informatics which emphasise the configurable nature of technologies, with attendant enabling and constraining effects (Kling et al., 2005). Configuring access to the platform was crucial in enabling LDs at UA, B and C to establish their respective roles of controller, broker and trainer in MOOC development. In this way both social actors and non-human actants can co-construct outcomes in a particular context. In turn this had wider implications for interactions between the range of actors involved with the project more widely, and the form, content and style of the educational materials educators produced - a key part of the established teaching role of educators (Boyer, 1990).

8.2.4 Delving deeper into LD and educator roles and interactions

The findings of the STIN analysis suggest a complex and multi-faceted LD role which demands further consideration. In line with the inter-disciplinary nature of Social Informatics, the analysis in this study also incorporates relevant social theory to avoid producing a "socially thin" account of activity (Lamb and Kling, 2003, p.197). The pre-MOOC online learning literature is clear that over time, online learning development roles have progressed from individualistic educators taking 'Lone Ranger' approaches, to more complex collaborations which need to take account of shifting demands and conditions. Though some descriptions rely on fairly functional accounts of distinctions and crossovers between roles (Caplan, 2008), even those accounts recognize the need to accommodate change and uncertainty.

This thesis draws on Whitchurch's extensive empirical research into changing identities and roles across established boundaries in HE as a way to understand educator and LD activity in a changing HE context. Whitchurch clearly identifies online learning initiatives and the roles of those involved with them as an example of third space activity in HE, yet does not consider the importance of the technology which provides a foundational aspect of such initiatives. The following section will explore the extent to which combining this third space perspective on online learning with the socio-technical heuristics of the STIN analytic strategy has been useful. It highlights how this combined approach illuminates the roles of those involved with MOOC initiatives, particularly in enriching understandings of the "expertise" of LDs as they operate as hubs in this context.

8.3 Learning designers as blended professional hubs in a socio-technical third space

8.3.1 LDs as third space hubs

Analysis of the case study data produced support for Whitchurch's idea that some individuals closely involved with online learning projects are drawn in to a third space in universities. This thesis confirms that, despite their differences from conventional online learning projects, MOOC initiatives share with them characteristics of "broadly based, extended projects across the university, which are no longer containable within firm boundaries, and have created new portfolios of activity" (Whitchurch, 2013, p.25). The LD as hub role was certainly seen as a "new portfolio of activity" across participants and cases, and as the previous section has argued, extends understandings of the LD role by considering important co-constructive interactions with seemingly peripheral actors and technologies. These findings coincide with Bisset's (2018) positioning of LDs in the third space in her study of role and identities formation amongst

'Educational Designers'. In contrast to Bisset's work, however, Whitchurch's concepts of third space processes and blended professionals contributed significantly to these extended understandings of LD, educator and other roles in MOOC development and will be considered further below.

8.3.2 Third space processes illuminate MOOC development and their 'fit' within institutions

It was useful to view MOOC development as a dynamic social process occurring in a third space environment, as this enabled use of empirically grounded concepts of processes of contestation, reconciliation and reconstruction to understand participant activities and roles. The fact that MOOCs do not 'fit' easily with established HE priorities, structures and roles is well established (Siemens, 2008; Daniel, 2014), and the idea of a contestation phase was extremely useful in interrogating the social aspects of this lack of fit. Interestingly, some of the educator experiences reported in Zheng et al. (2016) seem to clearly illustrate this idea of contestation in MOOC development. In Zheng's account, "fights", "vague guidelines", and struggles over control indicate contestation processes, though the authors do not directly cite the third space literature. According to Whitchurch, this contestation phase can be identified where boundaries and tensions between HE actor roles become apparent. This was clearly relevant to MOOC development initiatives in this thesis, as manifested in initial MOOC development arrangements (at UA, UB, and to some extent UC) which aligned with established divisions between professional and academic departments.

Applying concepts of the subsequent processes of reconciliation and reconstruction also proved useful, in which first negotiation of roles occurs, then construction of new routines, rules and resources are enacted. As the complexity and distinctiveness of MOOC projects became apparent to those involved, the concept of reconciliation showed how LDs were able to explore opportunities to redefine their own roles and shape those of others. The lens of reconstruction further helped to interpret the findings, and highlight how LDs and others created new rules and resources in an areas of activity which "may not fall explicitly within organizational structures" (Whitchurch, 2013, p.25). Although distinct realisations of rules, routines and the LD role emerged at each case location, interactions followed similar overall patterns and the LD as third space hub role emerged as common to each site.

The identification of this influential LD as third space hub role is a valuable outcome of the study. It adds considerable depth to much earlier accounts such as Beetham et al. (2001, p.4) and Oliver (2002, p.248) who respectively comment on the "pivotal" and "hidden negotiation" facets of

learning technologist roles (as LDs were then known) in conventional online learning. Again, the "'invisible' systems and actors" reported in Zheng et al. (2018, p.217) and their calls for some kind of "project manager" seem to resonate with the findings of this study, and with accounts from the online learning and third space literature. Both Beetham et al. and Oliver highlight how LDs occupy important roles in projects, yet have to exercise their influence indirectly as they often lack formal, institutional authority. Third space analysis has provided a detailed and empirically grounded framework through which to view these ambiguous LD roles in the wider context of HE. In this thesis it provides conceptual tools to understand how LDs involved with MOOCs can, as Oliver noted back in 2002, be "hybrid, marginal, yet central to institutional processes and change" (2002, p.246).

As noted in the literature review (section 2.10) the work of Oliver and Whitchurch does not directly intersect. However, the 'pivotal' and sometimes 'hidden' aspects of the work of LDs identified by Oliver share much in common with Whitchurch's empirically grounded concept of Blended Professionals in HE. Whitchurch's identification of dimensions of spaces, knowledge, relationships and legitimacies which characterise Blended Professional work enabled analysis in this thesis to substantially extend understandings of LDs. In their work on MOOCs, LDs move from being a border-crossing academic "tribe" (Oliver, 2012, p.222) to become third space, blended professional hubs who actively (though sometimes subtly) shape and define the roles and interactions of others.

8.3.3 Wider research scope and novel application of third space theory

The scope of this thesis is also novel and more extensive than many previous studies into the roles of LDs, educators and others involved in online learning initiatives. In terms of novel scope, this thesis applies current knowledge on online learning and the third space to MOOCs, a subject not previously approached in this way. Further, the findings are based on a multiple case study analysis, considering a wide range of relevant actors, in contrast to the relevant yet more narrowly focused single institution studies of LDs and educators by Keppell (2007) or Cowie and Nichols (2010). Keppell's identification of the LD as broker, and Cowie and Nichols' conception of the bridging role of LD have usefully informed this study, but the application of the STIN strategy and third space concepts have enabled a deeper insight into how LDs shape and define roles and structures in MOOC development more widely in HE.

Rather than 'bridging' or 'brokering' between established groups, this thesis argues that LDs working on MOOC projects carve out and occupy new forms of (third) space in their own right. Recognizing the potential for LDs to operate in this way has important implications for the

organization of future online learning projects. Planning of projects can use the concept of third space processes as a way to predict the extent to which the demands of new projects may or may not align with existing organizational structures, processes and roles. Similarly, planners can consider the ways that LDs might need to leverage the spaces, knowledges, relationships and legitimacies dimensions of their work to shape course development processes and interactions. Indeed, managers of LD teams could look for awareness of these dimensions of LD work as they recruit or develop teams of individuals in online learning projects.

8.3.4 A socio-technical gap in the third space

The socio-cultural focus of this study of LD work has been shown to be valuable, both in this study and the wider literature (Campbell et al., 2010). However, a key part of this thesis is the importance of considering the role of both social and technical factors in MOOC development, and the remainder of this section will discuss the socio-technical dimensions of the study.

In investigating the roles of LDs and educators in MOOC development, this thesis has identified a socio-technical gap in the existing empirical research on both third space in HE (Macfarlane, 2010; Whitchurch, 2013) and in TEL studies of LD roles (Beetham et al., 2001; Oliver, 2002, 2012). Studies by Whitchurch and Macfarlane have clearly identified online learning as an area of third space activity. It is curious, therefore, that the place of technology has not been previously considered directly in the third space given that technology is self-evidently an essential motivating element in online learning initiatives. By including a focus on technology (via the STIN strategy), this thesis has enriched understandings of third space processes, and the dimensions of blended professional activity.

In line with principles of Social Informatics, LDs were found to configure aspects of the socio-technical system (via architectural choice points) which in turn facilitated processes of reconciliation and reconstruction in the third space context of MOOC development. Technological choices were often intertwined in dimensions of blended professional activity which are conventionally conceived by Whitchurch as purely social aspects of third space HE roles. LDs used their skills as blended professionals to regulate access to technology, allowing them to side-step established power relations (for example educator control over content of course material). They were also able to reconfigure relationships between themselves and other individuals (e.g. Educators) who occupy previously more clearly defined institutional roles.

This socio-technical lens helped reveal commonalities and differences between underlying models of MOOC development across the sites. Combining third space and STIN analysis revealed how MOOC development networks initially emerged as conventionally ‘boundaried’ arrangements

with characteristics of the third space contestation phase (siloed (UA), course-based (UB) or training-based (UC) development models. Subsequently, the LD as third space hub arrangements emerged as processes of reconciliation and reconstruction were enacted via negotiation and creation of new rules and routines. As these socio-technical arrangements emerged it was tempting to identify specific points at which technologies were leveraged to 'cause' a change in the system.

However, seeing technologies as causes of particular effects in an institution would be to ignore the subtleties in the data and the well-established principles of Social Informatics which hold that the technological and the social is not meaningfully separable. Rather than creating change in and of themselves, choices regarding application or configuration of technology were made to accommodate a range of educational principles, priorities of those internal and external to the institution, and more pragmatic concerns of deadlines and feasibility. Again, these findings might have implications for the planning and implementation of future online learning initiatives, and help to focus decision-makers on factors more subtle than a simplistic, deterministic focus on 'effects' of a particular technology, regardless of context.

8.3.5 Learning designers in the socio-technical third space: Beyond bridging or brokering

Having looked at how third space concepts inform understandings of LD roles, and how a socio-technical perspective can enrich concepts of the third space, it is now possible to synthesize them in discussing LD roles in a socio-technical third space. The literature on learning technologist or LD roles recognizes their ambiguous, seemingly marginal, yet central LD role in HE projects. Indeed the way that LDs bridge across or broker between LD and subject departments, underpinned by their awareness of overall institutional priorities and the ability to negotiate has already been identified in the literature. In contrast to previous studies, however, this study has shown how LDs on MOOC projects do more than simply bridge between educator disciplines and their own field, and use more than solely social skills to do so.

Indeed, the analysis has shown that LDs in MOOC development are able to shape course development roles across a wide network of actors (within which educators are just one node), and direct course production processes through both social and technical means. This thesis argues that the forms of open, subtle, and hidden LD negotiation identified by Oliver (2002) are supplemented in MOOC development initiatives by dimensions of blended professional activity. When intertwined with technological choices, these blended professional dimensions of activity can amount to a "final say" over various aspects of MOOC production. This increased LD influence in course design compared to conventional course development activity may be a consequence of

the distinct challenges thrown up by the need to embed massive, open courses into an institutional environment more accustomed to conventional courses. It seems likely that the distinctive technologies, diverse range of social actors involved in projects, and the various pressures and incentives driving them combine to create more (third) space in which LDs can manoeuvre.

Of course, this study does not aim to directly compare LD and educator roles in MOOCs and conventional online courses, and cannot claim to generalize widely from this case across all online learning contexts. However, the concepts on which the study draws are grounded in considerable empirical research. Further, the data collected in this study are appropriately 'thick' to generate an understanding of educator and LD roles comparable to other studies in the field. As such the claims on the nature of LD and educator roles in the study are credible, especially in relation to the limited depth and breadth of existing research into educator and LD roles in MOOCs. Indeed, this study adds detail and depth to Najafi et al.'s (2015) claim that MOOC production goes beyond specialist educator input, and relies on teams in which LDs play an important part. In contrast to Najafi et al, who interview only educators at a single institution, this thesis provides perspectives from a range of social actors, at multiple research sites, using a socio-technical orientation. From this broader base of data collection and focused analysis, the depiction of LD as third space hub as crucial in MOOC development has emerged. The hub role is also shown to have important implications in the course design process.

8.3.6 Negotiating ownership and control of course materials in the third space

The emergence of the LD as third space hub role had important consequences for issues of ownership and control of course content in MOOC development. Research in Social Informatics has established that "who can change content and how that matters" is a fundamental element of systems which "connect technological artefacts to their social world" (Kling, 2002, p.224). Indeed, conventional online learning entails tensions as academics used to individualistic course design processes have to adjust to more collaborative methods (Cowie and Nichols, 2010; Gregory and Lodge, 2015) as they work with LDs to construct their courses. LDs, according to Caplan (2008, p.256) are required to represent interests of both educators and the institution. However, this thesis argues that LD take on even greater control over course content in MOOC development.

LDs have to carve out their third space hub role in order to manage the diverse and somewhat novel incentives and pressures which motivate or accompany MOOC production. This third space is created as institutions attempt to embed open and massive courses into existing structures, and LDs take on the hub position, shaping both the roles of those involved and the courses produced.

LDs make important social and technical decisions over control of content in MOOC projects, frequently reporting the need to “overrule”, “edit hard”, or “standardize procedures”, using access to technology as a way to consolidate their power in these areas. Though the literature recognizes that LDs tend to possess a broad understanding of the various institutional pressures and priorities at play in universities (Akella, 2015; Beetham et al., 2001; Campbell et al., 2009), this study identifies the ways in which MOOC LDs manage these pressures and priorities by leveraging a “marginal, yet central” position within the third space.

This finding reveals the challenges of dealing with issues of ownership and control in MOOCs, something which has important implications for future course planners and designers. Although Czerniewicz et al. (2016) have already identified copyright and the intellectual integrity of course content as a concern of educators working on a MOOC, their study was focused on a single course aimed at opening up and exploring a new field of study. This thesis has shown that these challenges persist even in well-established fields of study, across multiple institutions. Those planning MOOCs need to think carefully about the alignment between the aims of their courses, the form of content required and the range of stakeholders who might wish to influence the content. Further crucial concerns include managing expectations about who will produce the content and how it will be produced, and the processes for checking and managing content. Of course, online courses in general and MOOCs in particular are more than just assemblages of content, and these processes also have implications for the underlying course design.

As mentioned briefly in section 8.2.2, the weight of socio-technical pressures with which LDs had to grapple tended to draw LDs toward more conservative course designs in MOOC development. Despite initial aspirations towards producing innovative designs which resist a “content push approach” [UB_LD_01], LDs across the cases reported exercising fairly extensive control over final courses produced, ultimately producing quite conservative learning designs. This conservativism persisted as understandings of MOOC production matured, influencing decisions on selection, development and refreshment of courses. The thesis provides some support for speculation by Margaryan et al. (2015) that institutional marketing concerns (Margaryan et al., 2015) or technologist-driven platform designs (Laurillard, 2016) encourage a centralization and standardization in MOOC learning design.

However the lens of socio-technical third space analysis has revealed a wider range of forces at play in the socio-technical networks of MOOC development. Seemingly peripheral actors in media production, legal, or marketing functions are drawn into networks of activity as LDs struggle to represent a range of interests both internal and external to the institution. Technologies become embedded in institutional settings, whilst LDs have the opportunity to configure them to produce

particular enabling or constraining effects. This again has implications for course planners looking at MOOC initiatives, as careful consideration of the motivations behind course development, along with analysis of the interests and needs of those involved in development is required to produce efficient and effective course development structures and processes.

Figure 18 (below) shows a way of modelling LD MOOC development roles in a socio-technical third space. The left column shows how MOOC development projects move through third space processes of contestation, reconciliation and reconstruction, whilst the right hand column outlines the dimensions of Blended Professional activity on which LDs can draw during each phase of the process. The middle section shows how LD are able to shape their own and others' roles, initially boundaried within conventional institutional spaces and roles, to become third space hubs. Underlying these processes, dimensions of activity, and LD roles is an underlying technological 'layer', with which LDs interact to help achieve project goals. Configuration of technologies depends on the particular project, as they both shape and are shaped by their context of use.

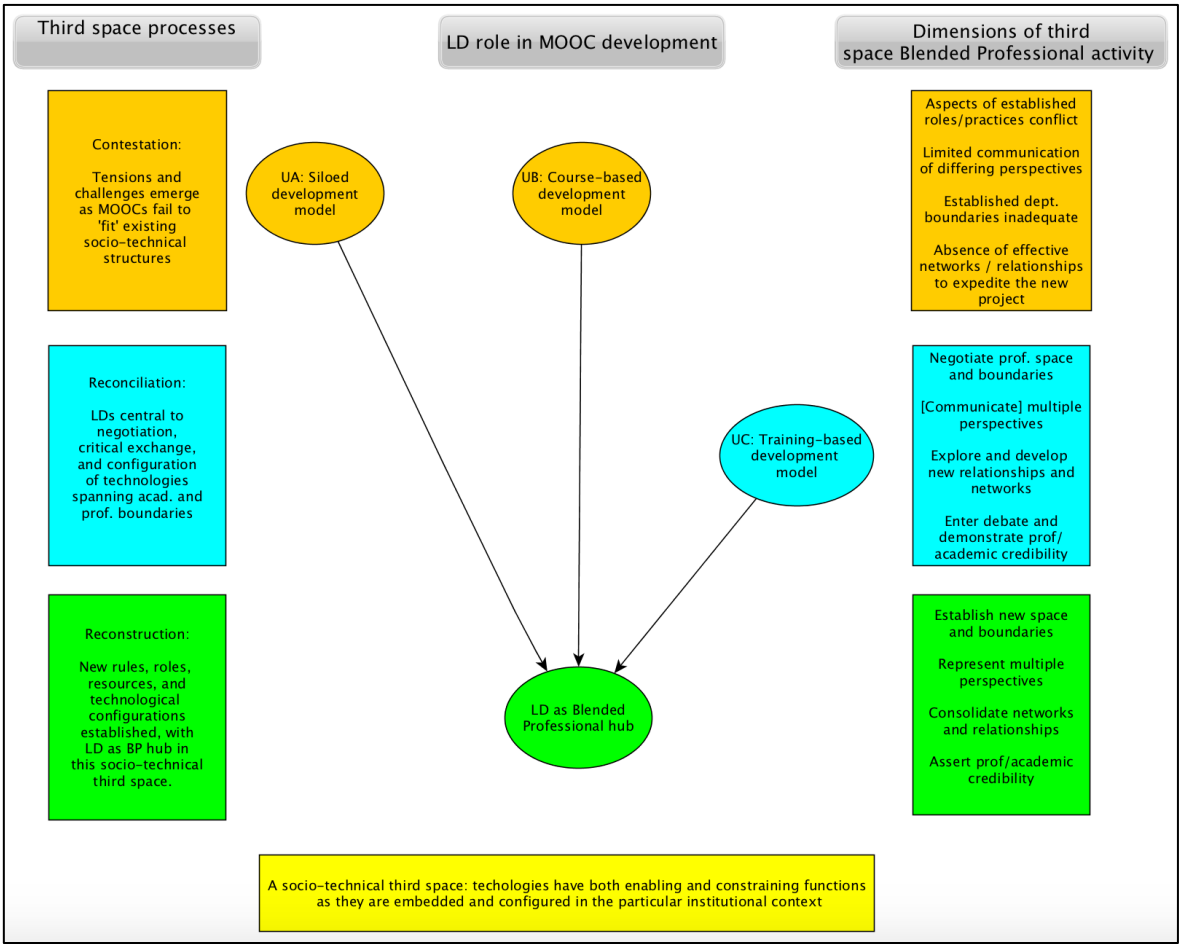

Figure 18: A model outlining the interaction of the LD as hub role, third space processes, and dimensions of Blended Professional activity in a socio-technical third space

This model could be of use to both higher level decision-makers considering overall course planning, and for LDs themselves. By recognising the importance of the LD as hub role in course development, planners could attempt to avoid or minimize periods of contestation in course development. Early recognition of the LD location in the third space might allow decision-makers to predict and plan for the development of more effective networks of working relationships required to support open and/or massive online courses, whilst a socio-technically aware perspective on technologies in the organization could likewise predict and plan for challenges which might accompany new technologies and any attendant unintended consequences which might result. This perspective is intended to optimize the flexibility of the LD as third space hub role. This would allow massive and/or open online learning projects to enter the reconciliation and subsequent reconstruction phases of third space processes as quickly as possible, rather than relying on conventional HE organizational structures and role distinctions which are likely to lead to tensions or conflict where new technologies fail to 'fit' neatly with them. This latter reliance on conventional HE structures and roles could result in projects becoming mired in the contestation phase of third space activity, hindering development of effective networks of course production.

The diagram can also be used by LDs themselves as a way to prepare themselves for projects in the third space. LDs should expect projects to move through these third spaces processes of contestation, reconciliation and reconstruction, noting that technologies may have a role to play in moving projects towards the most productive reconstruction phase. LDs can also use the model as a way to understand the progress of projects by asking relevant questions on third space processes:

- What stage is the project currently in?
- How can technologies be configured to ease tensions or facilitate development processes?
- Are any new rules, resources or (configurations of) technologies required to establish the project in the third space?

LDs can also use the model to understand and apply key dimensions of blended professional activity in the third space. They might consider such questions as:

- With which boundaries of roles and professional spaces do MOOC projects interact?
- How can a LD establish their professional and academic credibility across these spaces?
- What networks and relationships are most important to progress the MOOC project?
- What different perspectives on the institution do key social actors hold?

8.4 Unbundling of educator roles in the socio-technical third space

In addressing RQ2 on the roles of educators and LDs within MOOC development and implementation projects, the previous discussion section focused mainly on the role of LDs as blended professional hubs within a socio-technical third space in HE. This section examines in more detail the roles of educators in MOOC development, and focuses specifically on the way these educator roles are extensively unbundled within this third space. It discusses the socio-technical means by which these roles are unbundled, and the underlying drivers of unbundling in MOOC projects in HE.

8.4.1 Unbundling Boyer's teaching and integration roles of educators

The findings have shown how educator roles related to teaching are extensively unbundled in MOOC initiatives, particularly in terms of Boyer's categorizations of the teaching and integration functions of scholarship. One of the core activities in Boyer's concept of teaching is the development and testing of teaching materials, and there was a clear sense across participants and cases that educators make a far more limited contribution in this area of work during MOOCs than during face-to-face or conventional online teaching. Educator contributions were often limited to fairly simple written texts, or video messages, with functions of learning design, presentation and delivery sub-divided and distributed among other (human or non-human) actors and actants. Perhaps surprisingly, the collaborative aspect of the educator role (working with colleagues to design and deliver courses) was also found to be unbundled to some extent, as LDs took on or redistributed many aspects of collaboration which educators previously undertook in other courses where they were "both creator and deliverer". These findings are a far cry from the historic 'cottage industry' view of educators in HE (Elton, 1996), in which educators take a "lone ranger" approach to managing their own online learning projects (Chao et al., 2010). As shown in section 8.4.4, this unbundling occurs through both social and technical means, as LDs seek to shape MOOC development roles and processes to meet the complex sets of priorities and motivations which underpin MOOC projects.

8.4.2 Distinct forms and drivers of unbundling in MOOC development

Though the idea of unbundled educator roles in conventional online learning has previously been identified in the literature (Caplan, 2008; Tucker and Neely, 2010; Macfarlane, 2011), the form and drivers of unbundling in MOOCs are to some extent distinct. As research has shown, online learning involves a renegotiation of power relations between LDs and educators (Cowie and Nichols, 2010), but this study has demonstrated that a range of actors and non-human actants are

drawn into networks of MOOC development activity. Indeed, the STIN analysis highlighted architectural choice points in MOOC development which involved non-human actants, seemingly peripheral social actors, and a range of actions which became deemed undesirable. Consequently, this thesis adds breadth of coverage compared to similar socio-material studies focusing only on educator contributions to MOOCs (Bayne and Ross, 2014), and goes beyond somewhat generalized levels of analysis which identify the need for collaboration and a "team effort" in MOOC development (Najafi et al., 2015).

Looking more closely at the activities of educators in online learning, Caplan (2008) states that educators are required to "write the exercises, activities and examinations" in online courses, ensuring the content "is an appropriate alternative to the lecture content given in a traditional course" (2008, p.187). However, this thesis has shown how in MOOC development, roles are dynamically negotiated and shaped by LDs using a variety of socio-technical means during third space contestation and reconciliation phases of MOOC development. This allows LDs, operating as third space blended professional hubs, to balance the range of interests and priorities entailed by the way massiveness and openness is realized in each institution. In the reconstruction phase of MOOC development in the case sites, new roles, rules and resources were established, with educators often responsible only for identifying / creating suitable texts or video scripts as Subject Matter Expert, in a far more limited role than that identified by Caplan above.

MOOC development networks, populated by a variety of social actors both internal and external to the institutions, form in a third space in HE organizations. The space is very much affected by the increasing influence of the social, political and economic context of HE, particularly with regard to use of educational technology (Macfarlane, 2011; Selwyn, 2017). In this context, the LD as hub role identified in section 5.7 far extends Caplan's notion of someone who can "prevent or remove instructional barriers", and magnifies the importance of the need for LDs to "look after the interests of the institution" (Caplan, 2008, p186). Indeed, the approach of using a socio-technical third space lens on MOOC production has allowed these undefined institutional "interests" to be examined in depth, whilst also accounting for the socio-technical means by which they are "looked after", in this case by unbundling particular educator roles. As a result, the analysis has revealed how the LD as third space hub works to substantially unbundle (via social and technical means) educator roles in order to meet the complex and competing demands underlying MOOC initiatives.

8.4.3 LD credibility and lack of educator resistance facilitates unbundling

Unbundling processes often met little resistance from educators in the case sites as the complexity of MOOC projects became apparent (in reconciliation and reconstruction phases of development). As educators came to understand the nature of MOOC courses, few highlighted concerns about "de-skilling" as reported in the literature on the unbundling of academic roles (Macfarlane, 2011, p. 63). Educators frequently reported that they were happy to trust LDs who "knew what they were doing" in this unfamiliar territory. LDs established this credibility by working as blended professionals in a third space which spanned established institutional boundaries (as shown in analysis of the reconciliation and reconstruction phases of third space MOOC development).

Educators frequently felt that both they and the university had reputational concerns at stake during MOOC projects, as potential successes or mistakes were perceived as very public compared to conventional teaching and learning contexts. Nevertheless, the lack of a formal link between creation / delivery of MOOCs and more formal measures of academic performance (such as the REF) likely influenced educator approaches to course development and delivery (Weller, 2011, p.55). As Weller further observes, the criteria for reward or promotion "exposes what is really valued in academia" (2011, Ch.11). This lack of connection to formal reward or recognition structures, in addition to the high workload levels reported by all educators in the study, suggests further reasons for the lack of educator resistance to the unbundling of their roles in MOOCs.

In essence, LDs gain credibility through working in a space which is not well understood by those who occupy more well-defined roles within HE institutions. LDs across the cases reported gaining credibility in the eyes of educators in this way. This confirms, to some extent, findings of Cowie and Nichols (2010) that tensions over unbundling of educator roles can be diminished as LDs demonstrate their expertise and credibility via practical collaboration on projects where parties can show their "competences". It also highlights the usefulness of using the concept of third space processes to understand how such tensions arise and can subsequently be resolved.

8.4.4 Building empirical evidence for unbundling in MOOCs

In their extensive review of research into unbundling in HE, Gehrke and Kezar (2015, p.95) note that much of the literature on the subject lacks an empirical basis. This is true of much commentary on MOOCs, which can rely on technologically deterministic assumptions as evidence for widespread unbundling of educator roles in HE (e.g. Sharrock, 2017). However, the claims in this thesis are supported by extensive empirical evidence generated from case studies of MOOC development, and exploit a socio-technical perspective capable of taking into account the

technology which is a co-constructive element in the unbundling process. Analysis of this evidence also supports Gehrke and Kezar's conclusion that unbundling in HE is frequently driven by demands external to universities rather than evidence for its necessity. As the STIN analysis reveals, the drive to develop MOOCs in the case studies is strongly linked to external pressures towards commercialization and massification of HE, and so aligns with Gehrke and Kezar's longitudinal view of the external and sometimes ideological drivers of unbundling over two centuries.

8.5 Limited change in wider educator practices

Having discussed the implications of the findings on RQs 1 and 2 at length, the final section of this discussion chapter considers the findings (see Chapter 7) related to RQ3:

How do educators perceive the influence of MOOC development on their wider practices, and what documentary evidence is there to support this perception?

8.5.1 Ambiguity about MOOCs as research (discovery) practices

Overall, there were few aspects of wider educator practices (whether in terms of teaching, application, discovery or integration) which exhibited any clear change in routinised behaviour as a result of working on MOOC projects. This is predictable in light of an established literature in Social Informatics which demonstrates that introducing a particular technology into an established social context has limited potential to directly cause enduring social change (Meyer, 2014). The reality is of course more nuanced in that a range of social and technical forces interact as technologies become embedded in and also shape their contexts of use.

An important underlying limitation on wider educator practices in the cases under study was the lack of a clear understanding of how MOOCs align with established individual and institutional priorities. As noted in section 8.5.3 above, there was no consensus on whether MOOCs are a valued part of educator performance appraisals or evaluation exercises. This is significant as the "most important incentive wielded by universities to motivate academic staff is pay and reward" (Parker, 2008, p.237). Parker's study highlights the (gradually) increasing importance of teaching in promotion criteria for lower level staff (lecturers, senior lecturers) at the kind of universities in this study. However, it is important to note that the historic prioritization of research (discovery) over teaching and service that was once pronounced (Boyer, 1990; Dearing Report, 1997) still persists though to a somewhat lesser extent.

The findings showed, for example, that neither educators nor management had a clear idea of whether MOOC-related discovery (research) work could be of relevance to the REF. As shown in studies of scholarly practices and noted in section 8.5.3 (above), exercises like the REF "significantly shape behaviour, and do not simply measure it" (Weller, 2011, p.55). This shaping of behaviour is particularly relevant to MOOC-related activity, as they constitute a novel, open form of educational provision in HE comparable to those which Weller addressed in commenting that there is "no explicit encouragement to engage with new forms of outputs or to forefront an open access approach" (2011, p.55). Where clearly defined research outputs remain an "unspoken priority" (Harley et al., 2010), the ambiguous status of MOOCs does not provide a strong motivation for changes in educator practices.

8.5.2 Connecting application and teaching activity through MOOCs

The status of MOOCs as a teaching tool is also ambiguous as MOOCs in this study were non-credit bearing, yet institutions placed a high value on their potential for reputational enhancement (and potentially recruitment). Interestingly, the findings show that educators were able to connect application activity (often seen as engagement) and teaching in a novel way in their work with MOOCs. This suggests a possible revision of Boshier's model of Boyer's categories of scholarship when applied to educators working on MOOCs (see Figure 17, section 7.2). The realization of openness and massiveness in MOOCs in the cases allowed application activities to be moved to within the context of teaching within a taught course structure. Educators aimed to provide "thought leadership" and "spread the word" about new research insights as both an application and teaching activity, subsequently using public comments and feedback from MOOCs to inform their conventional teaching. This provides an indication of educators combining research-lead teaching and engagement (application) activities in a novel way, distinct from findings in comparable studies such as Najafi et al. (2015), which focuses only on internal impacts of MOOCs on the host university (such as opportunities for collaboration or reflection on teaching methods).

Many of the educators also felt that MOOCs caused them to think about focusing or 'essentialising' core messages in their conventional teaching. However, it must be conceded that there was limited documentary evidence of use of MOOC participant feedback or 'essentialising' messages to enrich this conventional course teaching. Though educators at UB were involved in embedding MOOCs into conventional courses, the extent of this activity and the prospects for it to become well-established, routinised practice was shown to be limited. Educators found it difficult to align MOOCs and conventional courses in terms of timings and content, a finding which supports that of earlier studies of embedding, for example by Bruff et al., (2013). Like studies by Blackmon (2018) and Lowenthal, Snelson and Perkins (2018), educators in this thesis report

perceived influences on their practices. However, Blackmon and Lowenthal et al. rely only on educator perceptions of this influence. In contrast, this thesis seeks substantive evidence of how this influence is manifested, but little evidence could be found.

Educators also lacked formal incentives and resources (in terms of time) to pursue such initiatives. Indeed, because of the complexity of MOOC projects and the conditions imposed on the use of the technologies (both external legal conditions on quality and copyright, and internal quality and marketing standards) educators were to some extent 'distanced' from the technologies and course development processes. These findings align with the principles of Social Informatics, which hold that technologies themselves do not cause change, but that they are configured to have enabling or constraining effects as they are actively embedded by social actors into their social context of use (Kling et al., 2005). Thus, as demonstrated in this thesis, MOOCs cannot 'embed' themselves into courses, educator practices or institutional contexts. This point ties in with Selwyn's (2013) argument from the field of TEL research that the "realities of institutionalized education - not least issues of time, technical expertise, interest and motivation" strongly shape the place of technologies in HE.

8.6 Taking a socio-technical perspective on Inter-professional practice

Having looked at the distinctive way in which educator roles are extensively unbundled in MOOC development and the socio-technical means by which this occurs, it is necessary to consider the implications of this unbundling activity. Unbundling entails subdividing academic work into specialist functions (Kinser, 2002), so a need to co-ordinate between parties to which these functions are distributed becomes necessary. Discussions of this co-ordination have been framed in terms of developing IPP across a range of areas in HE (see section 2.12.2) including those relating to TEL. This section considers the relevance of the socio-technical findings of this study to discussions of IPP.

Much commentary on and research into the development of MOOCs focuses on educators, the motivations of university management, or broader policy implication, yet neglects the role of those who actually create the courses (Liyanagunawardena et al., 2013; Universities UK MOOC report, 2013, p.28). However, this thesis has shown that in order to fully understand the development of MOOCs, the role of LD must be taken into account. Research into para-academics, the third space and IPP has begun to argue for more recognition of those occupying border-crossing or blended roles which blur the boundaries of established departmental or functional divisions in HE. The model of IPP calls for universities to recognize the status of all colleagues involved in complex and sometimes technical project work which is "academically

oriented" and "co-exists with and extends mainstream academic activity" (Whitchurch, 2012, p.116). This description fits MOOC development well. However, much like the third space concepts on which it draws, the model of IPP takes no direct account of the role of technology in collaboration.

The STIN approach has demonstrated that technologies, as they become embedded in their (inter-professional) contexts of use, can be configured to bring enabling and constraining effects. Unforeseen consequences can emerge, such as the exclusion of particular social actors, or privileging certain practices over others (for example, use of particular video production values or non-copyright resources in the case of MOOCs). As with research on the third space in HE, the need for IPP is often closely associated with the introduction or influence of new technologies into educational contexts. The work of learning technologists, for example, is cited as an exemplar of "blurring of boundaries" with academics by Courtney (2013, p.44) in her paper advocating use of IPP. As such, it seems important to consider how the roles and practices of social actors in "academically oriented project work" can be shaped by co-constructive socio-technical forces.

Courtney states that IPP is "quintessentially about working in close collaboration, engaging in joint problem solving and working towards achieving a common goal" (2013, p. 49). However, the findings of this thesis suggest that the form of collaboration, or problem solving, and indeed the nature of the "common goal" to be pursued can substantially change as projects and the technologies which underpin them become embedded in their contexts of use. Architectural choice points of access to or configuration of technologies are adjusted to meet institutional priorities, practical constraints, or organizational dynamics. The consequences of these adaptations can have significant effects on the outcomes of projects and the socio-technical systems which emerge to support them.

What's more, studies such as Courtney (2013) or Macfarlane (2011) cite the influence of "massification" as an important driver of the need for IPP. As this thesis has shown, however, bringing massiveness (or openness) into an HE context not structured to support it has wide ranging implications both social and technical in nature. The findings show how these social and technical implications "are not meaningfully separable" (Kling, 2003, p.56) as predicted in the Social Informatics literature. Massive and open access to learning materials, for example, entails subtle re-negotiation of organizational structures which challenge established boundaries between roles, require novel course development procedures and shape particular configurations of technology to manage institutional reputation and risk. Without the application of the socio-technical lens in this thesis, it is unlikely the full complexity of MOOC development and the roles of those involved could have been revealed. In summary, though collaboration towards a

common goal as outlined by Courtney is a clear aim in the case of MOOC initiatives, it is by no means simple to achieve in socio-technical terms.

8.7 Chapter summary

The discussion section has explored the findings of the study in relation to current knowledge in the literatures. It is argued that identifying the role of 'LD as blended professional hub' in a socio-technical third space constitutes a contribution to knowledge. It contributes to knowledge of MOOC development in adding depth of understanding regarding the LD role, and to research in third space in HE by addressing a hitherto unattended socio-technical 'blind spot'. Combining third space concepts with the STIN strategy has provided insights which illuminate both the importance of seemingly peripheral actors in the development process, and of the architectural choice points which are crucial in embedding and shaping MOOCs in their contexts of use. The research design also allowed these changes to be viewed in their wider social and institutional context, giving attention to the lack of 'fit' between MOOCs and more conventional university aims and organisational structures.

A further contribution lies in the collection of empirical evidence of the unbundling of educator roles in online learning (via socio-technical processes). However, the discussion section also acknowledges how the approach has been less successful in identifying broader changes in wider educator practices as a result of their involvement with MOOCs. This confirms existing understandings of the limitations of seeing technologies as deterministic drivers of social change.

Chapter 9: Conclusion

This thesis brings together a socio-technical analytic strategy (STIN) from the field of Social Informatics with the empirically grounded concept of third space from studies of higher education. In doing so, it produces a novel understanding of MOOC development and the roles of those involved with it. The concluding chapter summarises the motivation for the study, the research questions and their answers, the contribution of the research, the limitations of the study and possible future research directions.

This thesis was partly motivated by predictions in mainstream media and academic literature about the potentially transformative effects of introducing MOOCs into HE for educators, course design, and wider policy and strategic directions for educational institutions. Technologically determinist predictions of this kind are common, yet problematic in positing a simplistic relationship between inherent properties of technologies and their inevitable social effects. The socio-technical foundations of Web Science (and the field of Social Informatics on which this thesis draws) seemed to offer a more nuanced perspective from which to research the roles of those involved with MOOC development and the courses they construct.

To date, there have been relatively few studies into those who actually produce MOOCs (educators, LDs, and others) and their work in relation to the courses produced. Extant studies focus on the interaction of LDs and educators in conventional (non-MOOC) online course production and have highlighted potential conflicts and tensions which can arise in the course development process. Furthermore, MOOCs occupy a distinctive position in higher education as they do not align directly with the conventional aims of higher education (teaching, research and service), so present an intriguing object for study in this respect. In summary, though a number of studies above make a persuasive case for the *potential* of MOOCs to change educator roles and the courses they teach, socio-technically-oriented studies which empirically investigate this potential (and crucially also fully consider the LD role) are lacking.

9.1 What were the Research questions?

This thesis has investigated the extent to which MOOCs and educator and learning designer roles and practices are socio-technically constructed in higher education. To explore this issue, three research questions were posed:

1. What are the socio-technical systems related to MOOC development in which learning designers and educators are involved?

2. What are the roles of educators and learning designers within MOOC development projects?

3. How do educators perceive the influence of MOOC development on their wider practices, and what documentary evidence is there to support this perception?

9.2 What were the answers?

9.2.1 Research question one:

In addressing the first question, I used the STIN analytic strategy to generate data from interview transcripts and documentation at three case study locations, subsequently using thematic analysis on that data. Using this strategy, I identified complex socio-technical networks (STINs) related to MOOC development. Projects were underpinned by strategic institutional aims of reputational enhancement (and consequent reputational risk), concerns which were both motivated and magnified by the potentially massive and open characteristics of MOOCs. As MOOCs became embedded in each institutional setting, a range of social and technical factors both internal and external to the university shaped the development process and the form of courses produced. The form of courses produced and the social and organisational relations between those involved with them were significantly shaped by LDs, who were involved in particular system architectural choice points frequently relating to access to or configuration of technologies. LDs had an extremely significant, yet often subtly enacted role within MOOC development initiatives. LDs established a common hub-like position in the networks of MOOC development at each institution, in locally distinct variations of controller, broker and trainer. A range of seemingly peripheral social actors were found to be actively involved in MOOC production in addition to educators. In MOOC development, educators may have been perceived to be central to course creation, but in fact often had somewhat limited input into courses.

9.2.2 Research question two:

In relation to research question two, the concept of third space was useful in interpreting this ‘LD as hub’ role within the social context of HE. Indeed, the analysis demonstrated that LDs operated as third space ‘Blended Professional’ hubs, negotiating MOOC development roles and operating across and around departmental and institutional boundaries. The findings from the STIN analysis also made a significant contribution to understandings of third space concepts of processes of

contestation, reconciliation and reconstruction. The socio-technical perspective helped illuminate the means by which roles were negotiated during phases of MOOC development, with LDs often controlling access to and configuration of technology in shaping roles and development processes via particular system architectural choice points. This socio-technical understanding of third space highlighted the way LDs and other seemingly peripheral social actors were able to 'unbundle' the teaching and collaborative roles of educators to a significant extent.

9.2.3 Research question three:

The analysis related to research question three combined findings from the STIN analytic strategy with consideration of considered Boyer's categories of scholarly activity in order to analyse how educators perceived MOOCs to influence their wider practices. It revealed that educators felt that work on MOOCs changed their wider (non-MOOC) working practices in terms of increased public engagement and the way they communicated and 'essentialised' ideas in their teaching. Although the majority of educators in the study felt this was the case, document analysis and cross-referencing of participant accounts provided limited corroboration of this this wider influence in practice.

9.3 What do the findings 'say' to the literatures?

This study has shown that understanding the development of MOOCs in UK higher education demands consideration of the LDs involved with them, and recognition of the mutually shaping socio-technical forces at play in their construction. This section reviews the particular contributions to the literature that result from the research.

9.3.1 MOOCs, change in HE and the centrality of LDs

MOOCs have been widely highlighted as potential agents of change in HE, though reviews of the literature identify a lack of studies into their impact on the roles and practices of those who create them. Even studies that do investigate institutional motivations or educator roles in MOOC development and implementation give little attention to the role of LDs in this process. As such, there is a need for further research given the importance of the LD role as highlighted in the conventional (non-MOOC) literature on online learning (Keppell, 2007; Cowie and Nichols, 2010).

This paper argues that MOOC development and the roles of those involved in it cannot be understood without considering the role of LDs in the process. Drawing on empirical evidence from multiple institutions and data sources, the role of LD is shown to be crucial in MOOC development. LDs interpret and mediate between a range of internal and external incentives,

pressures and risks, and shape both the roles of others involved in the development process and the courses developed. This LD role is in some ways distinct from that in conventional online learning. This can be linked to the underlying institutional motivation behind MOOC development toward reputational enhancement (and managing reputational risk) and the consequent choice of a high profile, commercial platform provider as a partner in the initiative. Though the drivers of MOOC development have certainly changed over the past 10 years, an underlying commercial, marketing- or recruitment-focused intent persists in MOOCs of the kind studied in this thesis (Brown, 2018). The greater understanding of the LD role which this research generates can form a substantive contribution to the literature in online learning and MOOCs, and can inform approaches to future course planning and development initiatives in HE.

9.3.2 Supporting and extending understandings of collaboration in online learning initiatives

Addressing the gap in the research relating to LD roles in MOOCs, a significant finding of the study is the identification of the LD as hub role. LDs as hubs mediate and negotiate between a wide range of organizational incentives and pressures, and role-related priorities of other social actors. This hub role echoes earlier depictions of the socially "pivotal" (Beetham et al., 2001, p.4) role of learning technologists in conventional online learning HE initiatives and coincides with Bisset's depiction of educational designers enjoying increasing "strategic agency" (2018, p.15) in non-MOOC contexts. However, it also expands on these ideas by taking into account wider aspects of the socio-technical system in which MOOCs are produced in line with the STIN heuristics.

Via the STIN analysis, the research extends understandings of the "bridging" (Cowie and Nichols, 2010) or "brokering" (Keppell, 2007) role of LDs which focused solely on the social relations involved in educator-LD interactions. The thesis highlights a dynamic, multi-faceted and evolving LD as hub role, in which LDs actively shape a complex network of social actors and technological actants. Indeed, the identification of distinct realisations of the hub role at each case site speaks to the sensitivity of STIN as a heuristic device. Further, identification of this LD as hub role substantially elaborates on the relatively under-explored notion of "team-based" MOOC development processes (Najafi et al., 2015, p.237) and ways in which the tensions and constraints entailed by the distinctive challenges of MOOC development can be managed (Czerniewicz et al., 2016).

9.3.3 Using third space to elaborate on the dynamics of LD roles

A further contribution of the research is to bring together TEL research on LD roles and practices with broader HE educational research into the third space in universities. The contribution is novel on a basic level in that it is the first study to test the applicability of the third space lens to LD roles in the somewhat distinctive context of MOOCs. In demonstrating that MOOC LDs do indeed occupy third space roles, it adds to the existing body of research in higher education studies which highlight TEL initiatives as potential sites of interest (Whitchurch, 2008, 2012).

More interestingly, although TEL researchers have yet to directly draw on third space concepts in the online learning literature, this study demonstrates the value of applying this empirically grounded concept of third space to research into MOOCs / online learning more broadly. The idea that certain actors span conventional boundaries of roles and departments resonates with early work by Oliver (2002) and Beetham et al. (2001) into the roles of LDs in HE. It certainly challenges Caplan and Graham's (2004) more functional depiction of pre-defined roles for online learning initiatives within a centralized TEL unit, and speaks to Zheng et al.'s (2016) call for more understanding of MOOC production and management systems in HE. Indeed, Whitchurch's third space processes and dimensions of blended professional activity help to illuminate the means by which LDs come to occupy "marginal, hybrid, yet central" (Oliver, 2002, p.246) roles in both conventional online learning and MOOC initiatives.

Using these dimensions and processes enriches understandings of the "goodwill, expertise and rhetoric" which Oliver claims are characteristic of LDs. Part of these LD characteristics are "hidden negotiation" skills (2002, p.248). The third space lens helps explain how these skills, previously identified in conventional online learning initiatives, are enacted in MOOC development within particular institutions. A participant from UC illustrates the third space blurring of academic and professional boundaries well in explaining how LDs "had a pretty tight grip on [MOOC development] and a tight overview", yet maintaining that LDs "didn't tell them [educators] what to do".

9.3.4 Conceptualising a novel 'socio-technical third space'

This study has highlighted the potential for third space concepts to enrich the online learning literature. A further contribution lies in addressing the socio-technical 'blind spot' in Whitchurch's work. LDs in MOOC initiatives do indeed operate as blended professionals in a third space as Whitchurch's research might predict. However, these LDs shape their own and others' roles in this third space via both social and technical means which overlap and are "intertwined" (Kling et al., 2003). This suggests the value of adding an important technical consideration to previously purely

social conceptions of activity in and construction of third space roles. Indeed, combining insights from the STIN analysis and third space concepts helped explain exactly how aspects of LD "expertise" mentioned above (section 9.4.3) is actually leveraged via LDs configuring and controlling access to technology.

Whitchurch's work identifies diverse motivations, incentives and pressures, both internal and external to HE institutions which enable the emergence of the third space. This study has shown how these motivations and pressures are partially embodied in the various technologies, processes, contracts and agreements which accompany MOOC development. Thus, it is argued that researchers would benefit from conceptualizing a 'socio-technical third space' in which to study MOOC development and the roles of those involved in the development process. This approach is novel in bringing together a sensitivity to the way technologies shape and are shaped by their social context (from Web Science and Social Informatics) with the nuanced socially-oriented insights on HE offered by the third space lens.

9.3.5 Distinctive unbundling of educator roles in MOOC development

In examining the unbundling of educator roles, this study contributes empirical evidence of the phenomenon in an area of research where empirical work is frequently lacking (Gehrke and Kezar, 2015, p. 95). Furthermore, the findings indicate that the drivers and forms of unbundling in MOOC development are distinct from other domains of online learning. While studies of unbundling in conventional online learning focus on a negotiation of power between educators and LDs (Cowie and Nichols, 2010), this thesis identifies a diverse range of relevant social actors and non-human actants influencing MOOC development. Using Boyer's categorization of scholarship functions, the findings demonstrate that aspects of the teaching and integration roles of educators are distributed amongst a range of seemingly peripheral actors.

When a key underlying driver of MOOC development is reputational enhancement of the institution (and hence involvement with a high profile, commercial platform provider), novel pressures and incentives are brought to bear, contributing to these changes in roles during MOOC development. Viewing MOOC development as a socio-technical system also highlights how educator roles can be unbundled via configuration and control of technologies, or the particular values or conditions attached to their outputs (e.g. copyright terms, video production values, marketing standards for images). These insights add breadth to the body of findings of similar socio-material research into MOOC development which has previously focused solely on educator roles (Bayne and Ross, 2015), and as mentioned above adds depth to more generalized claims about the need for "team-based" course production (Najafi et al., 2015, p.237).

9.3.6 Limited change in wider educator practices

In terms of examining changes in wider educator practices, the findings of the study provide support for the rejection of technologically determinist perspectives (as highlighted in Oliver, 2011 and 2013 for example). Though roles of social actors in MOOC development evolved substantially, evidence of changes in educator practices in their wider university roles was limited. The connection between participation in MOOC development and formal performance measures or opportunities for career development at the case sites was unclear, and so introduction of technology alone was not sufficient to motivate significant changes in educator practices in their wider teaching or research.

In this sense the findings of this study align with that of Social Informatics literature and studies of TEL which emphasise the way technologies are worked into the realities of existing social contexts (Selwyn, 2013; Weller, 2011) and 'remade' within them (Oliver, 2013, p.41). MOOC projects were often complex, and expensive, with configuration of and access to technology carefully monitored. Educators often found themselves at a distance from the technologies and their implementation. In these circumstances, MOOCs did not at all resemble the "fast, cheap and out-of-control" technologies which are more likely to become part of wider academic practices (Weller, 2011, p.10).

9.4 Limitations

There are some limitations inherent in the multi-site case study research design, and the application of the particular theoretical framework, and these have been discussed at length in sections 4.6 and 3.4.9/3.5 respectively. This section will focus on more specific limitations generated by reflection on the overall project process and claims generated relating to the:

- fluid nature of the research domain
- researcher positionality
- comparability of findings to studies of conventional online learning
- scope of data collection on wider practices

Each is considered in turn in this section.

9.4.1 Fluidity of the research domain

One fundamental challenge for this research project is the rapidly changing nature of the research object and domain. MOOCs were in a relatively early stage of development at the outset of the

study (2015) in terms of technologies, institutional MOOC strategies, and understandings of them in the literature. As a result, the nature of MOOCs were and still are evolving in response to their changing social, economic, and technological and context (Brown, 2018). However, the aim of the research was not to predict or advocate for a particular design of MOOC or course development structure. Rather, one of the key contributions of the research relates to the inter-disciplinary nature of Web Science: to bring together a socio-technical perspective with insights from the empirically grounded concept of third space in HE. In doing so, it contributes to understandings of MOOC development process and perhaps those in online learning initiatives more generally.

As reported in White and White (2016a) the complexity of combining the nuances of STIN and third space concepts presented a challenge in the study. Social Informatics studies show that technologies are embedded in their contexts of use, yet Whitchurch argues that individuals in the third space resist the boundaries and constraints of these contexts, “redefining them dynamically”. As a result, the context of MOOC development “presents something of a moving target for STIN studies” (White and White, 2016a, p.10). However, through methodical (and admittedly sometimes gruelling) marshalling of data and checking and cross checking of findings and interpretations, it can be argued that a stable and credible depiction of MOOC development roles and practices within a bounded context and time period has been generated.

A further challenge of this study has been to resist a temptation to model particular points at which technological choices ‘kick-in’ within third space processes, though it was possible to show when architectural choice points coincide with dimensions of blended professional activity. To create such a model which shows when and how technologies are crucial is tempting, but would ignore the fundamental tenet of Social Informatics that the technical and social are intertwined and cannot be separated. In this study, technologies have been shown to be embedded within and co-construct their particular social contexts of use. Thus it has been impossible to generalise with any certainty on particular points in the process where technologies are relevant without reference to the particular context.

This point also relates to possible concerns that the findings of the case studies lack generalizability. Notwithstanding the arguments in section (4.6) outlining the rigour and credibility of the case study approach, the theoretical notion of a ‘socio-technical third space’ produced in this study has potential applicability to various areas of TEL research in addition to particular claims arising from this study relating to distinctive LD and educator practices.

9.4.2 Positionality of the researcher

The positionality of the researcher is a further potential limitation of the study. Though credible and coherent methods and theories have been selected to underpin the study, the researcher cannot claim unbiased access to the world or interpretations of it. The interpretivist paradigm within which the research design is located recognises that researchers and participants take an active part in creating and interpreting meanings and understandings about the world. As a result, the findings cannot be claimed to be objective or produced in isolation from the researcher's own views and values. However, as outlined in section 4.2.1, I followed recommended procedures of triangulating methods, taking regular detailed field notes during site visits, and producing reflective memos throughout the research project to allow reflection on my position and relationship to the data and the interpretations drawn from it. In addition, I've attempted to use extensive quotes, transcribed directly from the words of participants to illustrate the findings throughout chapters 5-7.

9.4.3 Comparability of findings

It is important to note that fundamental claims of this study regarding the extended role of LDs in MOOCs arise from the application of the particular analytic and theoretical framework used. Indeed the lack of research into LD and educator roles in MOOCs (especially research of a socio-technical nature) forms a warrant for the study. The findings mainly consolidate and extend the knowledge from the literature on roles conventional online learning, and those findings that are distinctive or contrasting can be explained by drawing on the conceptual framework of the study. As a result, these findings are intended to inform and extend rather than be directly comparable to those findings in the conventional online learning literature as those studies take different methodological and theoretical approaches. However, this does raise the possibility of applying a socio-technical third space lens to such contexts in future.

9.4.4 Scope of data collection

The claims regarding changes in wider educator practices resulting from involvement with MOOCs are based only on the available evidence. It is relevant to note that the data collection techniques used to generate these claims were limited to interpretation of particular participant perceptions (of their individual wider practices), and documentary evidence provided, in the main, by those participants. In contrast, it was possible to more extensively cross-reference across participant accounts and documentation from the data on MOOC development (which was a shared enterprise). A more in-depth study focusing only on effects on wider educator practices might use

a wider range of methods such as asking educators to produce “cognitive maps” of their technology use (Russell 2005, p.64), or a more extensive ethnographic exploration of how educators work ICTs into their practices (Fry 2004).

On a personal level, the challenges of this research project have taught me a great deal about the interesting, long and sometimes messy process of academic research, and the challenges of balancing the potential advantages of particular research methods or theoretical positions with their inevitable drawbacks or blind spots.

9.5 Implications and future research directions

This section considers the implications and possible future directions for the research in terms of:

- Conducting strategic decision-making and course planning in institutions
- Applying the socio-technical perspective to conventional online learning
- Proposing a research agenda for Inter-professional practice

9.5.1 Strategic considerations for MOOC development

At the level of strategic decision making, basic considerations raised by STIN analysis are important for decision-makers considering embarking on MOOCs or wider TEL initiatives. Management must account for the fact that partnership ventures and broader drivers of change (massification, commercialisation of education) external to the institution will interact with the dynamics of embedding new courses and technologies into particular institutional contexts. It is crucial that decision makers understand that online course initiatives are co-constructed under the influence of both internal and external technological and social factors.

‘Standard model’ accounts of technological solutions or transformations are to be treated with caution, with the understanding that technologies do not transform their contexts of use but rather become embedded within and co-construct these contexts. These considerations could help decision makers to consider hitherto unexpected consequences of introducing MOOC initiatives into particular institutions, some of which are outlined below.

9.5.2 Planning and developing MOOCs

On a more practical level, these findings have relevance for those responsible for planning and developing courses. Course developers may benefit from considering MOOC projects as third space ventures from the outset. Using Whitchurch’s ideas of contestation, reconciliation and reconstruction phases to plan MOOC development could help predict problems and maximize

project efficacy. With these considerations in mind, course planners could attempt to accommodate somewhat flexible organizational structures, which clearly accommodate important but seemingly peripheral social actors.

Ideally, such structures would respond to the demands of the project rather than relying on conventional role definitions and departmental boundaries which have emerged to serve conventional course production needs. Methods of oversight and periodic check points could be established which fit to project demands, whilst also considering the applicability of more formal institutional requirements for course quality or content. Furthermore, consideration could be given to how MOOC production teams are located within the broader organizational structure, or how well MOOC development roles and projects fit within or are distinct from more generalized TEL roles and departments.

As the LD role is clearly so crucial, the findings regarding the "expertise" and dimensions of third space blended professional activity might be of interest to those responsible for recruitment or training of LDs for these projects. Recruitment of LDs could consider whether candidates display an awareness of the 'soft skills' of managing Whitchurch's Spaces, Knowledges, Relationships and Legitimacies (see section 2.13). Training could also foster such awareness, alongside exploration of how technologies play a role in "modifying professional space and boundaries" or help individuals to "achieve credibility in the academic … space" (Whitchurch, 2009, p. 410). As discussed at length in Whitchurch's work, divisions between roles and functions in HE are well-established. Bisset (2018, p.16) notes briefly that LD activity in the third space may have implications for staff recruitment or training, but this thesis demonstrates the relevance of third space processes and dimensions of activity in highlighting the particular skills or perspectives required. Relatively novel third space roles, of which LD is here shown to be one, can be challenging and decision-makers would be well advised to understand that LDs must "manage the duality of 'belonging' and 'not belonging' to academic space" (2009, p. 410).

Further case studies of these MOOC training and course management processes could contribute to knowledge in this area. It will be useful to look at contemporary forms of MOOCs in this fast evolving domain, and to consider MOOCs on other platforms or across platform providers to extend the breadth of knowledge in this area. In particular, it would be interesting to test the generalizability of the 'LD as blended professional hub' role on other platforms or MOOC types. As argued throughout the thesis, research which takes a socio-technical perspective would be well suited to the task. However, a 'real-time' ethnographic perspective (e.g. Fry, 2004) which involves observation of the course design process, and perhaps the course materials produced would add

a further dimension to understandings in this respect, and add to more general overviews or summaries of online course design processes and roles (Caplan and Graham, 2008).

9.5.3 Taking a socio-technical perspective on educator and LD roles in conventional online learning

As mentioned in the limitations section, this study claims to support and extend findings in the conventional online learning literature in relation to the LD as blended professional hub role. It was noted, however, that the findings are not directly comparable as many studies of LD and educator roles lack a socio-technical element (Keppell, 2007, Cowie and Nichols, 2010). This suggests an opportunity for studies which combine third space concepts and a socio-technical perspective to research into educator and LD roles in conventional (non-MOOC) online learning contexts. This might provide an opportunity to confirm whether the massive and open elements of MOOCs are indeed significant in co-constructing the hub-like elements of the LD role. This third space, socio-technical focus could also be applied to the unbundling of educator roles in online learning. Reviews of the literature highlight a need for empirical evidence to support the extant commentary-based literature in this respect (Gehrke and Kezar, 2015).

The limitations section also noted the difficulties of identifying particular points at which technological choices become most relevant within third space socio-technical systems. This then highlights a potential area for further study relating to when or how particular technological choices are most relevant in the development of online learning. It is possible that a more focused study in this respect might yield results, and perhaps alternative socio-technical frameworks could also be considered. For example, Czerniewicz et al. (2016) were able to highlight particular areas of tension or conflict in their study of MOOC development, so perhaps following their application of Activity Theory to this issue may prove fruitful.

9.5.4 Applying the concept of socio-technical third space to Inter-professional practice

Finally, the thesis has argued that adding a socio-technical dimension to the concepts of third space in HE research more broadly is a valuable and logical proposition. IPP is an emerging area of research where such an approach might prove useful for a number of reasons. Studies in IPP recognize the ‘blurring boundaries’ and third space roles emerging in HE. They also highlight the relevance of ideas of third space, unbundling of conventional roles and need for collaboration in HE in the context of pressures of massification and commodification (Courtney, 2013). Furthermore, IPP clearly highlights the use of educational technology as a domain where this occurs. However, much like the third space concepts on which it draws, the model of IPP takes no

direct account of the role of technology in such collaboration. As such, future studies which use the concept of 'socio-technical third space' would seem well positioned to make a valuable contribution to this area of research. A future study could draw together the extant research in the domain, and perhaps suggest a research agenda as a next step.

This thesis has provided some very interesting and sometimes unexpected insights into the way MOOCs are constructed in higher education. It is hoped that it will provide a useful basis for further studies into the work of Learning Designers and others who come together to collaborate on new projects in the field of higher education.

Appendices

Appendix A Interview guide

This interview guide was used during semi-structured interviews with participants during the study. The questions were used to elicit discussion on the topics of interest. Questions were not used if particular topics were already covered in participant utterances around the topic, and the order was not strictly followed. The information in square brackets at the start of each numbered section, e.g. (RQ1c) refers to the research question to which the interview section relates.

Participant briefing:

- About me
- Purpose
- Ethics conditions
- Length/format/recording

1. Introductory / Background questions (RQ1a, d)

1.1. Could you tell me about your first experiences with online learning? And what about MOOCs?
1.2. What about your first experiences with MOOCs?

2. Institutional goals / strategy (RQ1b, e)

2.1 Why do you think the university is involved in MOOCs? Does this align with the overall role and mission of the university?

3. STIN (RQ1a-f, RQ2)

3.1 Could you map out for me the network of groups/people with whom you're involved in MOOC development? Please highlight/state:

- frequent interactions, important relationships
- new roles (created for this initiative)
- contacts you've started / stopped working with as a in MOOC projects
- individuals who might 'lose out' or be disadvantaged in some way
- interactions with / influence of the platform provider
- funding sources
- conflicts in the process
- key decisions in the process
- time commitments

4. Work processes (RQ1a, b, d, f; RQ2, RQ3)

4.1. Could you explain the typical work you do in relation to MOOCs?
4.2. How does working on MOOCs compare with creating/implementing other kinds of courses?
4.3. What's your distinctive contribution to MOOC projects?
4.4. Are there any key points / turning points in MOOC development?
4.5. What technologies do you use in relation to MOOCs?
4.6. What do you do with the materials generated as a result of involvement with MOOCs?
4.7. Can you give any examples in changes in MOOC design which you / your colleagues have instigated?

4.8. How (if at all) does your work with MOOCs influence your other duties?
4.9. Have your working practices changed as a result of working with MOOCs?

5. Training and development (RQ1a, d, f)

5.1. How did you learn about making and participating in MOOCs?

6. Developing and using MOOCs (RQ1b, d; RQ2, RQ3)

6.1. Can you describe any problems, impediments or frustrations in working with MOOCs?
6.2. Can you think of any advantages or benefits of working with MOOCs?
6.3. Is there anything that happens now with MOOCs that never used to happen in your previous academic work?
6.4. Will you be discussing MOOCs in upcoming performance appraisals?
6.5. How do you see the value of MOOCs in relation to the REF?
6.6. If there were something you could change in relation to your work with MOOCs, what would it be?
6.7. If technology were not a limiting factor, what would improve your work with MOOCs?

7. Communication and networks (RQ1a, c; RQ2, RQ3)

7.1. With whom do you tend to discuss, share or collaborate in your MOOC-related work? How do you do this?
7.2. Have these contact networks changed since you started working with MOOCs?
7.3. How did you decide whether to get involved with MOOC-related work?
7.4. Do you communicate more widely about your work with MOOCs (publications, talks,)?

8. Is there anything I've missed or that you would like to add?

Appendix B Interview participant codes

Code	Meaning
ED	Educator
LD	Learning designer
LEG	Legal representative / Resource manager
MGMT	Management representative

University A

UA_ED/MGMT_01	UA_ED_06
UA_ED_02	UA_ED_07
UA_ED_03	UA_ED_08
UA_ED_04	UA_LD_01
UA_ED_05	UA_LD_02

University B

UB_ED_01	UB_MGMT_01
UB_ED_02	UB_MGMT_02
UC_ED_03	UB_LD_01
UB_ED_04	UB_LD_02
UB_ED_05	UB_LD_03
UB_ED_06	UB_LD_04
UB_LEG	UB_LD_05

Appendix B

University C

UC_ED _01	UC_LEG
UC_ED_02	UC_LD_01
UC_ED_03	UC_LD/MGMT_02
UC_ED_04	UC_LD_03
UC_ED_05	UC_MGMT_01

Appendix C Glossary of key terms

Architectural choice point – a STIN term describing particular decisions taken which shape socio-technical systems, often taken in the interests of a particular group and which may have significant consequences for the operation and effects of a system

cMOOC – form of MOOC based on connectivist principles of learning, where learning is deemed to reside in the connections between participants or resources as nodes in a network

Contestation processes – the first of three 'processes' or 'narratives' which characterize the dynamics of third space activity. Contestation activity occurs as individuals work across professional and academic boundaries and tensions and challenges arise.

Course-based MOOC development model - an initial model of MOOC development identified in this thesis in which courses development is located within a subject department, attempting to mirror the way conventional subject courses are developed

Excluded actor – those who become excluded or marginalised from a socio-technical system. Identification of such actors through STIN analysis can help highlight how technologies have entered routine use.

Inter-professional practice (IPP) – emphasis on shared goals, problem solving and collaboration amongst groups of different but related professions in HE. Originates in studies of education and practice in the field of health and social care.

Learning designer (LD) – those working to apply principles of learning and instruction to planning and production of (online, in this case) learning materials and courses of study.

Learning designer as broker – a learning designer role identified in this study in which the LD leverages various technological and social means to mediate between competing demands across the university

Learning designer as controller - a learning designer role identified in this study in which the LD offers an extensive 'service' role which involves taking on a wide range of course planning and development responsibilities. Educator contributions in to courses in such cases become far more limited than their work on conventional courses.

Learning designer as hub – a LD role identified in this thesis in which the LD operates as a "hub" within the network of people, resources, priorities and pressures. The LD actively interprets and

filters the needs and demands of other social actors, whilst also influencing the organizational and technological choices underlying courses

Learning technologist – sometimes used synonymously with the title learning designer, though the title is now sometimes more associated with a technology-focused, support role.

Massive Open Online Course (MOOC) – Massive Open Online Course – in this thesis under the definition of "a course aiming at large-scale interactive participation and open access via the Internet" (Littlejohn, 2013)

Non-human actant – a term used in STIN (derived from Actor-Network Theory) to describe any artefact (technology, resource, contract etc) which can shape the actions of other social actors or actants in a system

Open Educational Resources (OER) – Open Educational Resources. Educational resources or material that are in the public domain or released under a public licence

Para-academics – those within HE who take on one or more elements of conventional academic roles (teaching, research, and service). Also identified in the literature on instructional design as those who support academics but also 'look after the interests of the institution'.

Peripheral actors – those working in organisations with roles which seemed unconnected or marginal to a particular activity, but can at times significantly shape roles, processes and procedures within socio-technical systems such as that of MOOC development

Practices - "arrays of activity" or "routinized behaviour" (Reckwitz 2002, p.249), which are seen as a way to understand both structure and agency in human behaviour

Reconciliation processes – the second of three 'processes' or 'narratives' which characterize the dynamics of third space activity. Reconciliation processes exhibit negotiation of difference and sharing of multiple perspectives

Reconstruction processes – the third of three 'processes' or 'narratives' which characterize the dynamics of third space activity. Reconstruction is characterized by creation of new rules and resources in a pluralistic environment

Roles - functional activity related to MOOC production or implementation which are negotiated in relation to social structures and the roles of others

Siloed MOOC development model – an initial model of MOOC development identified in this thesis in which existing departmental roles and boundaries remain in place, often causing conflict in online learning projects which span these pre-determined roles or boundaries

Social actor – a term used in Social Informatics and STIN to SI acknowledge the importance of humans as active agents who interact with and co-construct technology (rather than passively use it) within social contexts, shaping technologies and the practices associated with them

Social determinism – in relation to technology development and use (and in contrast to technological determinism), the idea that solely social forces shape technology and the outcomes or consequences associated with it. Technology as a simple tool.

Social Informatics – research concerned with the interaction of ICTs and their cultural or institutional contexts, and how this shapes design, use or consequences of ICT implementation

Socio-technical Interaction Networks (STIN) – a part of the broader field of Social Informatics, consisting of an analytic strategy used to understand the way ICTs become embedded in and co-construct their contexts of use

Socio-technical perspective – an overall concern with the mutually shaping interaction of technological artefacts and their cultural or institutional contexts

Technological determinism – in relation to technology development and use (and in contrast to social determinism), the idea that technology has inherent properties and that its use leads to particular outcomes or consequences

Technology Enhanced Learning (TEL) – the use of Information and Communication Technology to support or improve learning experiences

Third space – a 'third or supplementary space' in HE organisations which disregards conventional institutional boundaries between departments and functions. This concept challenges the binary perception of a distinction between professional and academic roles in HE, demonstrating that roles, tasks and functions in contemporary HE are more complex and intermingled than is often assumed

Training-based MOOC development model – an initial model of MOOC development identified in this thesis in which a central learning design teams attempts to train educators in MOOC creation, allowing them to take on development activities for themselves

Unbundling – a process in which extant roles of educators are split into particular specialist functions or even more specific activities, and then assigned to those in other roles within an organisation

Web science – the approach to studying Web artefacts and Web phenomena as socio-technical co-constructions which have contingent properties which emerge in particular social, historical and political contexts.

xMOOC – form of MOOC more associated with instructivist principles of learning, often involving (video) lectures, and multiple choice quizzes

Appendix D Ethics approvals

The following are anonymised versions of the ethics approvals granted by each of the case study institutions:

UA:

10 April 2017

Dear Steve

[XXXX] Ethics Approval Note on MOOC Research. ***Favourable opinion***

Thank you for your application (email, dated 16 January 2017) for ethics review. I can confirm that we are pleased to confirm [XXXX] are content for this research to receive a favourable ethical opinion on the basis of the information that was reviewed in relation to this application, University of Southampton ethics reference: ERGO/FPSE/17725.

UB:

9 December 2015

Dear Steve

This is email confirms that your submission relating to the study University of Southampton ERGO/FPSE/17725 was approved by the [XXXX] Ethics Committee.

UC:

28 January 2017

Dear Steve

Very many thanks for supplying me with the Southampton documentation. I have now looked over it and consulted with the appropriate [XXXX].

I am pleased to inform you that institutional clearance has been granted for you to proceed with your research into MOOCs as specified in your Application Form and that we are pleased to support your project here at [XXXX]. Please note, however, that in the event that you need to

make any substantial changes to your research specification, you should please submit an account of these changes to [XXXX] for approval.

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