
FROM BOOKS TO MOOCS AND BACK AGAIN: AN IRISH CASE STUDY OF OPEN DIGITAL TEXTBOOKS

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Introduction

This paper reports a work in progress to investigate the current and intended future use of open digital textbooks in Irish higher education. It begins by establishing that open digital textbooks, as a subset of the wider Open Educational Resources (OER) movement, have not featured prominently in Irish higher education policy texts. A brief synthesis of the macro-level literature reveals the strong North American influence driving innovations in open digital textbooks over the past decade, particularly in response to increasing concerns about rising costs. At the meso-level the research problem is framed by a gap in the literature and lack of information more generally about textbook use in Irish higher education, although more specifically the study aims to establish current and intended future usage of open digital textbooks. Five research questions that guide the study are then outlined along with the methodology for the first two parallel work packages: (a) an environmental scan and national baseline survey of open digital textbooks in the Irish higher education sector; and (b) a micro-level institutional case study of current practice around the use of textbooks and adoption of open digital textbooks more particularly. The final work package aspires to develop an open digital textbook initiative based on findings from earlier phases and the international literature. While the study is still at an early stage a critical perspective underpins the research as we seek to better understand the potential transformative advantages of open digital textbooks over and above the use of more conventional learning resources.

Background

Despite textbooks still being a common feature of the higher education landscape in many countries the open digital textbook movement has not yet featured prominently in Ireland. Finding little or no explicit reference to open textbooks or open digital textbooks from a systematic search of major Irish policy texts evidences this claim. The term *textbook* for example does not occur frequently ($n = 3$) in the “National Roadmap for Enhancement in a Digital World 2015-2017”, with the statement, “We will cut costs by going digital” with our textbooks’ appearing in a section under the myth of diminishing costs (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015a; p.7). More recently an Irish case study of open education policy initiatives, which is part of a wider European report

describing open initiatives in 28 EU countries (Inamorato dos Santos, et al., 2017), supports the view of a gap of policy-related activity in this area, as no reference is made to open textbooks.

On a related note, Ireland also stands out alongside of Latvia, Luxembourg and Slovenia in this European Commission report as the only countries not to identify MOOCs in the context of open education policy initiatives. The absence of the MOOC movement in Irish policy texts remains an intriguing gap, especially given the Government's current focus in the "Higher Education Systems Framework 2018-2020" on promoting flexible life-long learning (Ministry of Education and Skills, 2018). Notably, in 2017 the growth of MOOCs continued worldwide with an estimated 78 million learners registering for a free online course (Class Central, 2018). This figure is up by 20 million on the previous year and increases to approximately 130 million learners when China and other developing countries where English is not the primary language of instruction are included in the census. While globally MOOCs are still a major force in shaping thinking and the direction of the OER movement they have not yet replaced the textbook, as once predicted (Class Central, 2016), and rather it would appear the level of interest and global activity in promoting open digital textbooks is gaining momentum.

Synthesis of the Literature

Most of the major open digital textbook initiatives over the past decade have taken place in North America. Of course, textbooks have traditionally been an essential part of higher education for the majority of students in the United States (US) (Fischer, Hilton, Robinson, & Wiley, 2015). While the drive for openness is anchored in deep philosophical roots the growth of open digital textbooks in the US has been partly a pragmatic response to economic crisis, underfunding of higher education and rising textbook prices. It is reported, for example, that from 1978 to 2013 textbook prices in the US increased 812% and that in 2014 a typical student spent about (US) \$2000 annually on textbooks (Baglione & Sullivan, 2016). Another US study claims that since 2006 the cost of college textbooks increased by 73%, which is over four times the rate of inflation (Senack & Donoghue, 2016). Despite rising costs Allen and Seaman (2016) found in their survey of over 3,000 US faculty that virtually all courses (98%) require a textbook, or related study materials, as part of their suite of required resources. While evidence of textbook use is clear less is known about how students use these books but there is reason to believe that copyright infringement is widespread (Scorcu & Vici, 2012).

Although there has been a proliferation of OERs in most disciplines over the past decade the reality is the level of awareness, curriculum integration and repurposing of open resources by teachers remains quite low – at least in the US (Seaman & Seaman, 2017). However, open digital textbooks – essentially a collection of OER aggregated in a manner that resembles a textbook but may also be rich with media and hyperlinks – are an exception as they have proven easier to garner support of institutional leaders, policy-makers, and major charitable donors. This claim is evidenced by the strong lead taken by organisations such as the William and Flora Hewlett Foundation and in some cases government agencies, as clearly demonstrated in the BC Campus initiative.

BC Campus began in 2012 with a project to create a collection of open textbooks aligned with the top 40 highest-enrolled subject areas in British Columbia (Burgess, 2017). A second phase began in 2014 with an additional 20 textbooks. The project continues to grow with currently over 230 open digital textbooks available and at the time of writing the BC Campus OpenEd website claims that students have saved over \$5m (Canadian) through the initiative, which now includes over 40 participating institutions. While Burgess (2017) acknowledges beyond estimated financial savings that some of the other success factors are difficult to quantify the project has contributed to the wider acceptance of OERs and has helped in terms of changing institutional culture.

Looking to Europe

Around a third of the 28 European case studies reporting on open education policy initiatives previously mentioned above identify some type of current or planned open digital textbook project (Inamorato dos Santos, et al., 2017). While few rival the scale of enterprise wide projects such as BC Campus in 2017 a major open digital textbooks initiative began in the United Kingdom (UK) led by the OER Hub to test the transferability of the North American model of success to the local context. More specifically, the UK Open Textbooks project is framed by the following overarching research question:

What is the viability of introducing open textbooks in UK higher education through the testing of two proposed models: OpenStax and OpenTextbook Network approaches?

As part of the project a series of workshops has been offered throughout the UK along with the development of a teacher textbook survey. The findings of this survey, which have yet to be formally published, coupled with a growing body of research evidence on the usage, implementation and sustainability of open digital textbooks will inform our own work in the Irish higher education context.

Research Problem

At this point our knowledge of whether traditional textbooks remains core to the student learning experience in Irish higher education is largely speculative. With more widespread implementation of Virtual Learning Environments (VLE) throughout the sector and the growth of OERs it might be reasonable to assume that usage of textbooks is declining; however, we simply do not have data to support or refute this assumption. In a similar vein, we have little or no data on the amount of money Irish students spend on textbooks to support their study, to what extent they decide to purchase them, and if the costs are a significant barrier to their success. Accordingly, the research seeks to address this gap in our knowledge.

At a deeper level we still need further evidence to test the underlying assumption that the use of textbooks (print and digital) and the students who utilize them will have better academic experiences and demonstrate improved academic performance (Hilton, 2016). Putting aside any projected financial savings the deeper question is whether the development of open digital textbooks leads to a transformative advantage over the use of more conventional study

resources. In other words, we should not lose sight of the risk of merely replacing an old technology (print textbooks) with a newer innovation (open digital textbooks) without fundamentally questioning the role and value of the textbook in new 21st century models of education.

Research Problem

Set against this wider backdrop and the emerging literature in the area the research seeks:

- To investigate the current and intended future usage of open digital textbooks in Irish higher education and their transformative potential.

Research Questions

The research is framed around five overarching research questions:

- What is the current usage level of textbooks in Irish higher education?
 - What is the current use of textbooks?
 - What is the current use of digital textbooks?
 - What is the current use of open digital textbooks?
- What awareness, experience and knowledge do Irish educators have of open digital textbooks?
 - What value do lecturers place on textbooks?
 - What is lecturers' practice in terms of textbooks?
 - What are lecturers' perceptions of the quality, suitability and potential of open digital textbooks?
- What awareness, experience and knowledge do Irish students have of open digital textbooks?
 - What value do students place on textbooks?
 - What is students' practice in terms of textbooks?
 - What are students' perceptions of the quality, suitability and potential of open digital textbooks?
- What are the perceived advantages and disadvantages of adopting open digital textbooks in Irish higher education?
 - What are the pedagogical benefits?
 - What are the actual and potential financial benefits?
 - What are the potential disadvantages?
- What are the perceived barriers and enablers likely to influence the successful enterprise-wide adoption of open digital textbooks?
 - What are the major barriers?
 - What are the major enablers?
 - What are the key lessons for Irish educators?

Methodology

The research adopts a mixed methods approach involving online surveys; follow up interviews; and analysis of public databases and relevant websites potentially listing textbook requirements. There are three main work packages. The first work package involves an environmental scan and national baseline survey of the sector to establish the status of textbooks, and more specifically the level of adoption of open digital textbooks, in Irish higher education. Work package two will undertake a micro-level institutional case study of current practice around the use of textbooks and adoption and perceived value of open digital textbooks more particularly. The final work package aspires to develop an open digital textbooks initiative and wider Irish community of practice in the area based on findings from earlier phases and key lessons from international literature.

Preliminary Findings

To date the findings of the first work package undertaking an environmental scan of the Irish higher education sector reveals a dearth of open digital textbook initiatives. For example, a Google search using the terms “open textbook”, “open digital textbook”, “Ireland”, and “Irish Higher Education” reveals only one result on the first three pages relevant to Ireland, which happens to be a Twitter stream dating back to 2010. Further analysis of potentially relevant links using the wider search terms “Ireland” and “Open Educational Resources” locates just two main initiatives of any note.

Firstly, search results provide information on the now closed National Digital Learning Resources (NDLR) service funded by the Higher Education Authority (HEA) of Ireland. The NDLR was an OER service providing a national open repository, online resource bank and community portal, shared between the seven universities and 14 institutes of technology (Marcus-Quinn & Diggins, 2013). The service was originally established and funded by the HEA in 2005 as a pilot project and went to full service in 2010. The NDLR’s mission was to promote and support Higher Education sector staff in the collaboration, development and sharing of learning resources and associated teaching practices (McAvina & Maguire, 2011).

According to Marcus-Quinn and Diggins (2013) by 2012 the NDLR service hosted over 27,000 digital teaching and learning resources. From 2005-2012 the HEA spent approximately €5m on the NDLR service (HEA, 2012; cited in Marcus-Quinn & Diggins, 2013). Given the level of funding and reportably mixed reviews of the service the NDLR was placed in limbo in 2012 before any formal evaluation could take place (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015b). The NDLR’s demise remains a sensitive topic in Ireland and although speculative the experience may partly explain why there has not been a more focussed policy response to the emergence of open digital textbooks as a subset of the wider OERs movement.

The second major initiative this wider search strategy identified was a report on “Learning Resources and Open Access in Higher Education Institutions” in Ireland written by a large team led by Dr. Angelica Riskey from the University of Limerick (National Forum for the

Enhancement of Teaching and Learning in Higher Education, 2015b). While the emergence of open digital textbooks is acknowledged in this report to a large extent the deliberate focus on *little OER* placed *big OER* such as MOOCs and larger scale open education initiatives outside of scope. This decision is partly understandable given the conception of OER was based on the following William and Flora Hewlett Foundation definition which incorporates a repurposing dimension:

“Teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Unlike traditionally copyrighted material, these resources are available for ‘open’ use, which means users can edit, modify, customize, and share them” (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015b; pp.7-8).

In many respects the report places the value of little OER in their ability to go beyond and/or provide alternatives to textbooks. This perspective is reflected in the national online survey of academic staff completed as part of the project by 219 respondents in April 2015, with one participant reporting:

“Yes, I value having resources available. Not being constrained by what the textbook authors and editors decide to provide for us is very important. It’s part of the academic dialogue” (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015b; p.90).

It follows that no explicit reference to the potential of the open digital textbook movement appears in the report’s final recommendations, which focus on raising greater awareness and showcasing excellent OER, embedding OER and a wider Open Educational Practices (OEP) philosophy more intentionally within national professional development initiatives, and a call for an ongoing programme of action research.

A follow up search of the National Forum for the Enhancement of Teaching and Learning in Higher Education’s website along with their dedicated T&L Scholarship Database using the terms “textbook” and “open textbook” revealed only one other relevant publication. A review of Ireland’s higher education technical infrastructure conducted in 2016 compared the findings of an online survey of senior IT managers and Chief Information Offices (CIOs) at 22 Irish institutions with the results of the annual US-based Campus Computing Survey to provide an international benchmark on key priorities (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2017). As shown in Figure 1 below using survey results reproduced from the original report (p.26), 68% of Irish respondents compared to 79% in the US perceive that open source textbooks and OER content will be an important source for instructional resources in five years. The gap between the two countries is even more notable in the findings that only 17% of Irish respondents as opposed to 38% in the US consider open source OER textbooks very important looking to the future. Therefore, from the perspective of

Irish senior IT managers and CIOs the adoption and wider use of open digital textbooks in higher education at this time does not appear to be a high priority initiative.

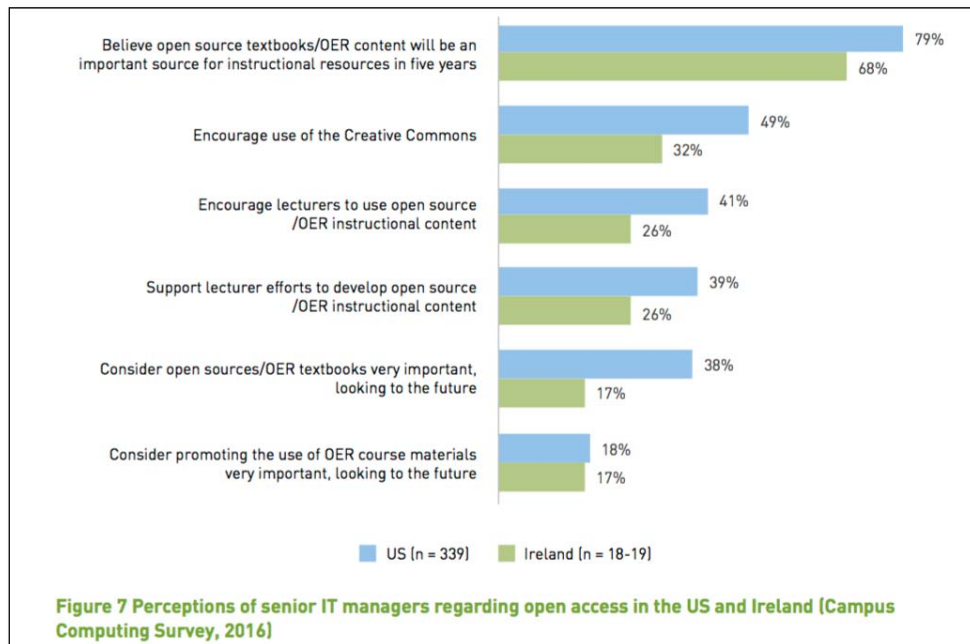


Figure 1. Perceptions of senior IT managers regarding open digital textbooks

Finally, two other desk research methods were deployed to locate relevant open digital textbook initiatives. A dearth of activity in this area was found by using the search function on the websites of all Irish universities and institutes of technology using the term *open textbooks*. In a similar vein, searches of the websites of the Computers in Education Society of Ireland (CESI) and Irish Learning Technology Association (ILTA) yielded no relevant results; and nor did a keyword search of the published proceedings of related conference papers and presentations dating back to 2010.

At the institutional level a preliminary analysis of an internal database of textbook requirements for students at Dublin City University (DCU) for Semester 1 and 2 of the 2017/18 academic year confirms widespread expectations of textbook use. This conclusion is triangulated by information contained in a publicly searchable website listing textbook requirements. For example, over 3,000 of DCU's modules mention at least one textbook. Of the textbooks list 15,922 (72%) are classified as required whilst 6,729 (28%) are listed as recommended reading. However, further analysis of the specific textbooks listed is required to identify what proportion is available in printed and digital formats. This analysis is currently underway at the same time as the development of an online survey to gather data on the practices and perceptions of both staff and students concerning their use (or non-use) of print and digital textbooks. We hope to report the results of these surveys along with the findings of a national survey exploring the use of and perceptions towards the value of open digital textbooks in the next six months.

Conclusion

This research in progress addresses a significant gap in our understanding of the adoption, patterns of use and perceived advantages and disadvantages of open digital textbooks in Irish higher education. The study takes place at a time when there remains a dearth of government policy and related research in the use of both big and little OERs in Ireland. This interpretation is supported by our desk research of Irish policy texts and evidence from multiple sources revealing no major initiatives specifically in the area of open digital textbooks. Given the North American experience, and growing level of interest in both the UK and Europe, we hope this Irish case study will contribute to better understandings of the potential transformative advantages of open digital textbooks. Of course, like MOOCs we also understand that textbooks are not a single monolith entity and their educational affordances depend on how they are used by teachers and learners. For this reason, the research aspires to pilot and launch an Irish open digital textbooks initiative as a platform for further learning and development.

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DIVERGENT PERCEPTIONS FROM MOOC DESIGNERS AND LEARNERS ON INTERACTION AND LEARNING EXPERIENCE: FINDINGS FROM THE GLOBAL MOOQ SURVEY

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Abstract

As the provision of MOOCs continues to grow exponentially across the globe, much of the criticism on the quality of the learning experiences provided is based on its typically low drop-out rates. There is strong evidence that completion is not a goal for the majority of MOOC participants neither does it affect their satisfaction and perception of the quality of their learning experiences. Based on a literature review and analysis of existing quality approaches and indicators for MOOCs, the Global MOOC Quality Survey was designed and conducted in order to access quality perceptions of actors in the MOOC design and implementation process ($n = 267$). In this paper, we present its first results relating to the designers' and learners' experiences with MOOCs and their offered four interaction types: learner-facilitator (LF), learner-resource (LR), learner-learner (LL) and group-group (GG). Comparing the different perspectives of learners and designers, our analysis presents significant differences in MOOC learners' and designers' intentions and experiences. The correlation differences of the MOOC learners and designers on the interaction in MOOCs are significantly very high. These results are also compared with the opinions from MOOC designers collected in a number of semi-structured interviews. Based on the analysis, we conclude this divergence is based on a misunderstanding between the two target groups on interaction. MOOC designers recognise its importance, but do not seem to understand and meet fully the expectations of MOOC learners, as their perception maybe influenced by institutional context.

Introduction

Globalisation and the impact of the internet have contributed significantly to transform living and working conditions in the last two decades (Castells, 1996). The emergence of the global economy and the network society has brought new complex societal challenges which have a great impact on how education is perceived, organised and conducted. There is a strong pressure from stakeholders to innovate educational practices, making them more flexible and adjustable to context (Peter & Deimann, 2013; Stracke, 2017a). This results from the need for citizens to adapt more easily to changing social and work contexts (EC, 2011). But, public education systems are also expected to educate citizens to become agents of change themselves.

In order to meet this challenge, major changes are being introduced in education systems worldwide (OECD, 2016). From a prevailing teacher-centred perspective, education is evolving to a dominant learner-centred approach as the circumstances and modes of learning are becoming more diverse as well.

As the complexity and scale of these challenges increases, public opinion and Governments are also pressuring education systems to respond ever more rapidly and effectively, using less resources. In face of this, educational institutions and all stakeholders at the different education levels have been feeling the need for education provision to become more scalable, interoperable and flexible. In this framework, openness has become a key value in education and learning, similarly to what also happened although independently in science and innovation. Thus, inspired by the UNESCO declarations on Open Education (2002 and 2012), in particular the policy on Open Educational Resources (OER) (UNESCO, 2012), and fostered by the European Commission's communication on "Opening Up Education" (EC, 2013), educational institutions across Europe are transforming, especially in the higher education sector.

One of the drivers for this transition has been the phenomenon of Massive Open Online Courses (MOOCs). The first MOOC bearing that designation was the "Connectivism and Connective Knowledge" course (CCK08) offered by Siemens, Downes, and Cormier at the University of Manitoba, Canada, in 2008 (Daniel, 2012; Teixeira & Mota, 2014). It drew on the experiences by Alec Couros (EC&I 831: Social Media & Open Education – <http://eci831.wikispaces.com>) and David Wiley (INST 7150 Introduction to Open Education – http://opencontent.org/wiki/index.php?title=Intro_Open_Ed_Syllabus) who, in 2007, decided to open the formal, for-credit courses they were teaching at their institutions to anyone who wanted to take part in them in a not-for-credit, informal way. The term MOOC was coined by Cormier, after registrations for the course went past 2000 participants (Cormier, 2008). Although this first MOOC set itself in the larger context of Open Education and OER, it really became a huge success when Thrun and Norvig opened their "An Introduction to AI" course at Stanford, in the Fall of 2011, to anyone who wanted to take it for free, an impressive 160000 plus people registered for the course (Teixeira & Mota, 2014).

This unexpected event, coupled with the reputation of the professors and the institution involved, set in motion what would become the educational phenomenon of 2012 (Daniel, 2012). Soon after Thrun created Udacity, and Koller and Ng created a similar company, Coursera. Also in 2012, MIT announced the partnership with Harvard which established the EDx consortium. In the following years, MOOC provision grew constantly. MOOC providers and learners are now spread across all regions of the globe. According to Class Central (Shah, 2018), the number of MOOCs in 2017 is higher than ever (9,400) and the same applies to MOOC learners (81 Mio.) and providers (800+).

The unprecedented and rapid popularity of MOOCs in the last years has led to an increasing global debate about their quality, involving researchers, practitioners, institutional leaders and learners. To address the quality issues involved in the discussion, the Massive Online Open

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Education Quality (MOOQ) project was initiated as the European Alliance for the Quality of MOOCs. It is a 3-year project funded by the European Union under the ERASMUS+ call. MOOQ is directly relevant to several key aspects of the 2011 EU Modernization Agenda.

Designing for quality MOOCs

The quality of the learning design and the experiences it provides for participants has been subject to much debate in recent years. Typically, the drop-out rates has been used as an indicator for measuring the quality of the learning experience. In MOOC settings, evidence indicates they are consistently very low and often below 10% (Hansen & Reich, 2015; Margaryan, Bianco, & Littlejohn, 2015). This has fuelled much of the criticism on the quality of current MOOC design. A new research agenda has been claimed in literature to reboot MOOCs (Hansen & Reich, 2015; Reich, 2015). However, this discussion of low quality MOOCs is based on an improper use of drop-out rates as a quality indicator given these courses are mostly non-formal learning experiences (Onah, Sinclair, & Boyatt, 2014). Moreover, most of the criticism in academia derives from the fact MOOCs are seen as a synonym for “teaching classes online to a high number of students”, without a sound understanding of how the notions of *open* and *massive* were the real change operators in the initial concept, or of the history and practice of distance and online education (Teixeira & Mota, 2014). In fact, most universities have adopted a traditional teacher-centred model of MOOC design. Although it allowed them to claim to be innovative, it actually didn’t change much of their old culture and pedagogical practices.

As a consequence, alternative evaluation measures for MOOCs have been proposed and discussed in order to better address learners and their personal intentions and goals in learning with MOOCs (Henderikx, Kreijns, & Kalz, 2017; Stracke, 2017b; Teixeira & Mota, 2014). As MOOCs become an important part of higher education institutions’ provision and are increasingly used in formal learning contexts, the debate on how they meet quality standards gains relevance. To contribute to informed decision-making by providers and designers, the MOOQ project aims at developing in an open dialogue with the experts’ community a Quality Reference Framework (QRF) for MOOCs. An international alliance was established to connect and bring together key experts and organizations to collaboratively address the quality of open online learning and education and, in particular, MOOCs.

One key element to assure the success and the quality of learning processes is social interaction. This is particularly the case in online learning and especially in open learning contexts as it happens with MOOC settings (Tawfik et al., 2017). Research has provided much evidence that interactions with content, teacher/facilitators and peers lead to better results (Zimmerman, 2012), a perceived higher quality of courses (Reich, 2015), satisfaction with the learning experience (Sher, 2009) and perceived effectiveness (Nandi, Hamilton, & Harland, 2012). Early literature on MOOCs has investigated the nature of learner interactions with their course environments. However, to date we know very little about the nature of interactions between learners and facilitators or how these actors perceive the value of exchanging information with one another (Gillani & Eynon, 2014).

In fact, individual support or tutoring is impossible in a scalable or massive course environment. While there should be suggested activities and guidance from the course organizers, these can be carried out only at a more general level. Learning support in a MOOC environment has to rest mainly in the learning community, through collaboration, dialogue, peer feedback and active engagement from participants in the learning process. Participants in MOOCs are therefore expected to take an active role and be responsible for their own learning, but also seldom to actively engage in helping build a supporting learning community (Teixeira & Mota, 2014).

As Moore points out, interaction is a term which carries many meanings as to be almost useless unless specific sub-meanings can be defined and generally agreed upon (Moore, 1989). In our research we have applied the three interaction types defined by Moore for distance education: learner-instructor (LI), learner-content (LC), learner-learner (LL). But, we've also included an additional fourth kind of interaction, as MOOCs by definition imply targeting and involving a high number of learners, potentially an unlimited amount. As such, learning activities are often conducted not individually but by random teams or groups of learners who join for a specific interest. The revised typology for learning interaction is the following: learner-facilitator (LF), learner-resource (LR), learner-learner (LL) and group-group (GG). In this paper we present a comparative analysis of the learners and designers perception of their experiences and interaction in MOOCs, focusing on interaction. The results will lead to the development of a future QRF to support quality MOOC design.

The Global MOOC Quality Survey

The first output of the MOOQ project was a survey on existing practices and design patterns for integrating quality approaches on emerging open online courses, including active discourse on open issues and concerns arising from the massive, large-scale implementations, showcasing paradigms of key players in the field. The goal was to reveal design patterns, both current and evolving beyond the classic theories of distance education. The analysis of the collected data will allow to derive best practises that are appropriate input for the design of the QRF.

Based on an in-depth review of literature and the analysis of existing quality approaches, evaluation instruments and quality indicators for MOOCs, we have prepared the Global MOOC Quality Survey, which was designed in two steps: First, a small pre-survey with a set of potential questions was developed and administered. We could already see from the pre-survey respondents (n = 45) that the pattern of MOOC learners' intentions when engaging in a MOOC experience was not similar to the one shown by the designers.

The following step was the development and launch of the Global MOOC Quality Survey which targeted three different groups of actors in a MOOC environment: learners, designers and facilitators. The survey was conducted in an open format over a period of four months in the first half of 2017. For its dissemination, the MOOQ team had the support of the leading international associations and institutions in the field.

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On Table 1 below an overview of the number of participants from the three target groups is presented.

Table 1: Participants of Global MOOC Survey

	MOOC learners	MOOC designers	MOOC facilitators	TOTAL
Participants	166	68	33	267

As shown on Table 1, the number of respondents was significantly high for this kind of survey. As expected, the number of learners who responded is higher than the number of designers and of facilitators. Comparatively, the number of facilitators is quite relevant as not many MOOCs provide facilitation.

According to the gender profile, the female MOOC learners who participated in the survey are younger and reporting a lower level of highest education. This feature is in line with their lower age. The distribution is also not surprising in what refers to the age range when compared with MOOC and average populations, whereas the educational level is very high in relation to the average population but very similar to the reported MOOC populations (Dillahunt, Wang, & Teasley, 2014; Glass, Shiokawa-Baklan, & Saltarelli, 2016). Both male and female groups of learners are coming from all five continents even if the majority originated from Europe.

Results on learners' and designers' perceptions on MOOC experiences

The findings from the Global MOOC Survey on the designers' and learners' perspectives on experiences and interaction in MOOCs are described in this section (for more details see Stracke et al., 2018). On Table 2 we present the responses of the learners on their learning experience (question item LLE4).

Table 2: Answers on Learning Experience LLE4 by Learners

	n	VB	B	N	G	VG
Learning experience	166	4	4	13	75	70

VB: Very Bad, B: Bad, N: Neutral, G: Good, VG: Very Good

On Table 3 we show the responses of the designers on their design experience (question item DDE4).

Table 3: Answers on Design Experience DDE4 by Designers

	n	VB	B	N	G	VG
Design experience	68	1	2	13	33	19

VB: Very Bad, B: Bad, N: Neutral, G: Good, VG: Very Good

As shown in Tables 2 and 3, most of the 234 learners and designers who participated in the survey reported positive experiences with MOOCs. Over one third of them (38%) rate their experiences as very good (VG) and close to half (46%) declare them as good (G). This perception, however, is not similar in the two groups. Almost all of the learners (87%) report a very good (VG) or good (G) experiences with MOOCs while slightly less designers share a positive perception (77%). The result is much more significant though when we look only at the

highest rating. In fact, close to half of the learners (42%) report their experiences as very good when compared to only 28% of the designers. The high degree of satisfaction shown by the learners with their MOOC learning experiences is consistent with the results from most MOOC surveys. This is not surprising and it demonstrates how completion rates fail to capture the essence of a non-formal learning experience.

On the other hand, a possible explanation for the divergence between the perceptions on experiences by learners and designers may be linked with the great challenges faced by designers in their work. It seems designers might underestimate the complex multiple factors involved in course design for open and scalable learning environments. As such, they might feel unease when interpreting their design experiences.

Results on learners' and designers' perceptions of interaction in MOOCs

Next, we present specific findings from the Global MOOC Quality Survey on the MOOC interactions as perceived by the designers and the MOOC interactions as reported by the learners. On Table 4 we show the learners' responses on the experienced interactions in MOOCs (LF, LL, LR and GG = question items LLR4-1 to LLR4-4).

Table 4: Answers on Interaction Items LLR4 by Learners

	n	N/A	SD	D	N	A	SA
LF by learners	146	20	5	13	48	37	23
LL by learners	146	15	3	17	34	51	26
LR by learners	146	9	2	8	25	61	41
GG by learners	146	37	4	15	50	24	16

N/A: Not available, SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

From the answers, it is clear learners perceive as more relevant the interaction with resources. Most of them (70%) strongly agree (SA) or agree (A) with this statement. A not so strong agreement (53%) is reported by learners regarding interaction with peers. Even so, this two types stand out as the perceived as more significant. Looking at the interaction with facilitators, only 41% strongly agree (SA) or agree (A). This is an interesting finding although not surprising given the special characteristics of a typical MOOC learning environment.

As presented in detail in another paper (Stracke et al., 2018), the bivariate correlations between the learners' interactions (LLR4 items as predictors) and learners' experiences (LLE4 as outcome) show very high significant relations between three types of interaction and the learning experience (LLE4), namely LF (LLR4-1: "Interaction between learners and facilitators"), LL (LLR-2: "Interaction among learners") and LR (LLR4-3: "Interaction between learners and learning resources"), whereas there is no significant relation between GG (LLR4-4: "Interaction among teams and groups") and the learning experiences (LLE4). In addition, the coefficient of determination (R²) measuring the substantive importance of an effect is very high for the three interaction types LF, LL and LR.

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On Table 5 we present the designers' responses on the designed interactions in MOOCs (LF, LL, LR and GG = question items DLR4-1 to DLR4-4).

Table 5: Answers on Interaction Items DLR4 by Designers

	n	N/A	SD	D	N	A	SA
LF by designers	52	2	1	5	11	24	9
LL by designers	52	1	1	3	11	19	17
LR by designers	52	3	1	0	4	22	22
GG by designers	52	8	2	10	14	13	5

N/A: Not available, SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

The results shown are consistent with the learner's although with a higher expression. An even larger level of agreement is reported by designers in what concerns the interaction with resources. The very large majority (85%) strongly agree or agree with the statement referring to the interaction with resources. The same phenomena occurs in relation to interaction with peers (69%). However, the difference between the previous type and the learner's interaction with facilitators is not as clear as in the case of learners. As much as 64% strongly agree or agree with the statement opposed to only 41% of the learners.

As explained in detail in the above mentioned paper (Stracke et al., 2018), the bivariate correlations between the designers' interactions (DLR4 items as predictors) and designers' experiences (DDE4 as outcome) do not present any significant relation between the four interaction types (LF, LL, LR and GG) and the design experience (DDE4). But, the results are quite different for the two interaction types LL and LR and for the two interaction types LF and GG. The coefficient of determination (R^2) measuring the substantive importance of an effect is quite high for the two interaction types LL and LR: They are sharing around 4.5%.

Comparison of learners' and designers' perceptions on interaction

Comparing the correlations from the learners' and designers' answers it seems that their perspectives on the importance of the three traditional interaction types are very contradictory (Moore, 1989). There is consensus on the fourth interaction type (GG) as the p value is the lowest for both, learners and designers, i.e. no direct relation can be demonstrated. Among the three interaction types with very high significant relations for the learners, two interaction types (LL and LR) have a much lower p value, i.e. a small relationship could exist for the designers whereas it is excluded for the other interaction type (LF) with $p = .703$. In general, it is surprising that designers do not value interaction as much as the learners what could lead to MOOC designs not fitting the interests and demands of the learners (as referred previously for a more detailed analysis see Stracke et al., 2018).

Input from semi-structured interviews with designers

In the framework of the research, a number of additional semi-structured interviews was conducted with providers, designers and facilitators. Regarding interaction in MOOCs, it is particular significant to review the perspective shared by the designers. For this purpose, we've

selected a set of three interviews (2 males and 1 female). All the designers interviewed are much experienced.

The importance of interaction is recognised by all three designers and they agree this depends on the design options. As one designer states, a MOOC in which interaction and collaboration do not happen is very likely to be unsuccessful and therefore will have no relevance to the institution that provides it. In addition, it is also stressed by the designers the connection between interaction and the pedagogical approach and design model selected. However, it can also be concluded from the interviews that the different approaches to the design process across institutions can influence substantially the options taken by the designers. In the case of one of the institutions represented there is a reference pedagogical model for MOOCs in place, which has been subject to continuous improvement. This model promotes a learner-centred design and awards much importance to interaction. Another institution provides a set of broad design principles (interactivity, flexibility, innovation, contextualization, among others), but confers teachers the responsibility to individually choose the principles to include in the MOOC design.

Based on this input from the interviews, we can conclude that although designers acknowledge the importance of interaction, institutional context might play an important role in how this importance is perceived by designers in their actual practice.

Conclusion

In this paper we present the first findings from the Global MOOC Quality Survey with a focus on the comparison between designers' and learners' different perceptions of their experiences and perspectives on interactions in MOOCs. Regarding their perceptions on the MOOC experiences, we've found the designers report a less positive perception of the quality and impact of their design work than the learners as they rate consistently higher their learning experiences. In what relates to interaction, major differences were found between learners' and designers' perception of the importance of three traditional interaction types identified by Moore. There was a very high significant relationship ($p < .001$) between the learners' MOOC experience and the three interaction types LF, LR and LL and a significant relationship ($p = .026$) for the fourth interaction type GG, which was added by us. On the contrary, we didn't found a significant relationship between the designers' MOOC experience and all four interaction types (for the full analysis see Stracke et al., 2018).

Comparing the different perspectives of learners and designers, our analysis presents significant differences in MOOC learners' and designers' intentions and experiences. The correlation differences of the MOOC learners and designers on the interaction in MOOCs are significantly very high. We suggest as an explanation for this divergence the different perspectives hold by designers' and learners' on interaction in MOOCs. MOOC designers do not seem to understand very well the needs and demands of MOOC learners or may be too much conditioned by their institutional environments in their design options, as the results from the additional interviews suggest. This leads us to conclude that it can be questioned whether designers and institutions/providers are currently understanding and thus fully meeting the expectations of

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MOOC learners. Given the importance and impact of this innovative type of educational provision, we believe there is the need to foster the dissemination of quality learning design models and practices specific for MOOCs which are clearly learner-centred and based on successful distance and online learning experience.

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