Open & online: Wales, higher education and emerging modes of learning

Report of the Online Digital Learning Working Group

March 2014

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Foreword

Recent years have seen an explosion of interest around the world in new modes of student learning based on the emergence of digital teaching and learning resources freely available to all on the internet. These include what have been termed 'open educational resources' (OERs) and 'massive open online courses' (MOOCs).

In February 2013 Leighton Andrews AM, then Minister for Education and Skills in the Welsh Government, set up an Online Digital Learning Working Group 'to examine the potential for online digital learning and how the Welsh Government can support the higher education sector in this growing field'. This report offers the conclusions of the Working Group's investigations and makes a number of recommendations to the current Minister, Huw Lewis AM, and to higher education institutions in Wales.

The text of the Minister's statement establishing the Working Group, given in full in Appendix 1, includes the formal terms of reference:

'To advise the Welsh Government on

- the potential competitive threat posed by global technology-based developments to the higher education sector in Wales

- the potential opportunities afforded by technological development for the Welsh higher education sector at a time of constrained public expenditure

- to what extent the Welsh higher education sector is working collectively to bring economies of scale to maximise the opportunities afforded

- to what extent technological development may provide a platform to increase participation in part-time and full-time higher education, again in a period of constrained public spending.'

The Working Group's members brought a wide range of experience and expertise to our discussions, from further as well as higher education, and from England as well as Wales. Their names are listed in Appendix 2. Dr Paul Richardson of Jisc RSC Wales acted as our Professional Adviser and researcher. He was largely responsible for conducting the informal consultation exercise (see Appendix 3 for a summary of the results and a list of the respondents) and he wrote the valuable background paper reproduced as an annex to the report. The Working Group was ably serviced by Kerry Darke, Neil Hayes, Dylan Wyn Jones and Jamie Anderson of the Department of Education and Skills. Many people were generous in giving their advice and information, including Martin Bean and his

colleagues in the Open University, Cable Green (Creative Commons), Owain Huw (Coleg Cymraeg Cenedlaethol) and Cliona O'Neil (HEFCW).

I am grateful to all of these and many others, including all the respondents to our consultation, for combining to make the work of the Working Group a positive, well-informed and harmonious experience, and hope that our report will succeed in stimulating thought and action.

Andrew Green
Chair
Online Digital Learning Working Group

1 Introduction

During recent years a fresh philosophy of 'openness' has made itself felt in higher education and the wider world.

This movement to make data, information and knowledge freely and openly available to the public has been made possible by the fact that digital communication has become a common and natural experience. Knowledge for many is now synonymous with digital knowledge, stored and available online, accessed through smart phones and tablets, and shared through social networking tools.

'Open software' has been available for some time as an alternative to proprietary products. Governments have begun to release large-scale digital data for wider public use and re-use. In research the 'open access' movement has challenged the traditional model of scholarly publication, based on gate-keeping by commercial publishers charging high subscriptions.

A similar 'open and online' spirit is now abroad in the practice of teaching and learning, as many start to question the assumption that resources – teachers and the materials they produce for learning – should necessarily be held within the walls of a single institution for the benefit of its members alone. Under this model learners benefit, it is claimed, from multiple kinds of flexibility – of place, time and cost. In one sense the spirit and intent here are not so new: UK and Wales have a long, rich and progressive tradition of 'extramural' and adult education, largely founded on notions of knowledge for all. The Open University was established with similar goals in mind, utilising the (then) new technologies of broadcasting. New factors are the opportunities for participation presented by digital technologies and the fact that content is free and has the capacity to be user-led.

Online or internet-mediated modes of teaching and learning in higher education are not new. Universities and other organisations have for many years produced what have been known since 2002 as 'open educational resources' (OERs). Today thousands of stand-alone teaching and learning materials at higher education level, including courses, lectures, laboratory or classroom activities and self-assessment tools, are freely available on the internet for anyone – lecturers, students or the public – to use and re-use.

What is relatively new is the emergence since 2008 of 'massive open online courses' (MOOCs), and the impact they are beginning to have on educational thought and practice. It is no accident that interest in their low-cost, high-volume economic model has coincided with an anxiety about

the costs of higher education and a shift towards students rather than the state paying for much higher education teaching. It is also relevant that they have come at a time when internet has become a wholly natural medium for students, including many in developing countries.

MOOCs tend to consist of entire, self-contained academic courses or modules. Registration and the course itself are generally free to all, though other elements such as certification may bear fees. There are usually no restrictions on student numbers. Some individual MOOCs can attract over 150,000 initial registrations around the world (a 'registration' may in this context amount to little more than an expression of interest). Well-funded organisations like Coursera and EdX have grown up to act as platforms for MOOCs devised in partnership with prestigious university partners. Learners may be able to connect online with other learners and share educational experiences, especially if courses are designed to be synchronous, and in some cases they can be assessed on what they have learned through online marking or peer assessment.

In this report we refer to all educational courses and resources made freely available online, including Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs), by the use of the generic term 'open and online resources' (O&Os). 'Open' in the context of OERs normally refers to the fact that resources are made available to be exploited and adapted by users, since licensing conditions imposed by their authors or publishers are deliberately liberal. The resources contained in MOOCs, on the other hand, are not normally reusable in this way: 'open' refers to the fact that courses are freely open for learners and teachers to access , but not to adapt.

It is often held that O&O resources hold powerful potential to increase student numbers, widen access to higher education or extend pedagogical practice. Some go further and claim that MOOCs in particular represent a seriously disruptive development, with a capacity to change practice in traditional institutions or even threaten the existence of the weakest of them. Since, they argue, any learner anywhere in the world can locate high quality courses and use them in their own time, free of direct charge, without qualification preconditions, and regardless of whether they are members of a higher education or any other institution, MOOCs offer the possibility of a substantial alteration in how higher learning takes place.

Others predict that MOOCs could have another effect, the 'unbundling' or disarticulation of the higher education experience. The functions of course planning, teaching delivery, access to learning resources, tutorial support and assessment, at present linked together in a single educational process in a single institution, may in future become detached from one another. For example, a MOOC might supply deliver a series of expert lectures, and some automated self-assessment, with tutorial help and certification of achievement supplied elsewhere. In some contexts, for example vocational

education, MOOCs could challenge the traditional pattern of the three year undergraduate or one year postgraduate course.

'O&O' resources and courses hold different attractions to different parties. Governments may see them as an answer to higher education costs seen as unsustainable to the exchequer. Commercial platforms like Coursera expect to make profits, recouping their large investments in MOOCs through various income streams. Higher education institutions may treat them either instrumentally, for example as a means of attracting additional students, possibly from overseas, to follow existing degree courses, or intrinsically, as a new educational experience, especially in transitional contexts. For instance, they may aim resources at groups of learners who would not naturally contemplate a university education, or at employees needing to refresh or extend their vocational skills or knowledge. O&O methods lend themselves naturally to collaboration between HEIs and other bodies: schools and further education colleges, employers and their organisations, and fellow-HEIs. When planning their MOOC offerings most institutions have joined with other HEIs in large-scale ventures like Coursera or the Open University's FutureLearn.

There may be other benefits from developing O&O resources. The ability to track and gather data about students and their educational progress in a highly systematic and detailed way through online 'analytics' could help improve the way courses are organised in future. Skills and techniques gained in planning online courses could be reused in on-campus teaching, in the process developing the capacities of the institution's teaching and support staff.

During the last two years the emergence of MOOCs has received much attention in the educational media and beyond, and much excited speculation on the impact they might have on existing higher education practices. This in turn has led to a subsequent reaction from others who cast doubt on their revolutionary potential. These sceptics typically point to the incompleteness of the educational experience offered by an online-only pedagogy, the low completion rates for most MOOCs, their claimed unsuitability for some types of learner, their inability to confer meaningful accreditation, and the lack of convincing business models for a product with worldwide reach but whose essence is the absence of a student fee.

O&O resources, and in particular MOOCs, are continually developing – the Open University, for example, launched its new FutureLearn platform in September 2013 – and the arguments about them will inevitably change their focus in future. While this report can only capture a snapshot of this changing picture we assess in following chapters the significance and the potential of O&O resources, in general (Chapter 3) and in the context of Wales (Chapter 4).

2 List of recommendations

To the Minister for Education and Skills

1 Widening access to higher education to those with low participation backgrounds

Fund the development of O&O resources for use in schools and colleges, with the aim of raising aspirations of learners from low participation backgrounds. This scheme should be co-ordinated through collaboration between HEIs and schools and colleges in their region, via existing Reaching Wider Partnership networks.

Investigate the use of Hwb as a host for the O&O resources developed, with the intention of establishing a central repository where all schools and colleges may access these resources.

Extend the work of the Open University OpenLearn Champions project to cover the whole of Wales via the Reaching Wider Partnerships.

Liaise with NIACE Dysgu Cymru, Agored Cymru, and others to align O&O resource production with the needs of adult learners pursuing agreed progression routes, including CQFW.

2 Developing skills for the workplace and the Welsh economy

Develop a strategy, working with other agencies, to raise awareness of the potential for online learning to support economic development.

Use the Welsh Government's sector panels to foster dialogue between stakeholders (including educational providers and employers) in order to identify opportunities to develop skills using online resources.

Examine how online learning should be integrated into the approach for programmes funded through the European Social Fund.

3 Developing Welsh language skills for employment

Develop a Welsh language skills MOOC at higher education level so that students and work-based learners can develop their professional Welsh language skills and potentially seek certification for those skills.

To the higher education institutions

4 Reviewing institutional policies, monitoring developments and exploiting opportunities

Agree what the institution's overall approach to open and online resources should be, monitor external O&O developments, and exploit opportunities to produce and use resources.

5 Strengthening institutional reputation and brand

Exploit open and online resources in appropriate circumstances to showcase the quality of learning opportunities.

To the Minister and the higher education institutions

6 Improving the skills of higher education staff

Institutions should provide academic staff with the skills and support they need to make most effective use of open and online approaches to learning.

HEFCW should continue to contribute to the costs of Jisc's programme on open and online resources and take advantage of Jisc's expertise.

HEFCW and the Higher Education Academy should take a lead on this agenda.

7 Licensing and sharing open educational resources

The Welsh Government should encourage the systematic adoption of open licensing for open educational resources produced by HEIs in Wales

Where possible staff and institutions should release open educational resources using an appropriate Creative Commons licence

Institutions should make open educational resources widely available, including via the Jorum repository.

3 Open and online resources in higher education today

This chapter summarises the research and other evidence about O&O resources considered by the Working Group. More detailed information and full references will be found in the Background Paper.

The Working Group recognised at the outset that internet-based technologies and their application to education are subject to rapid and unexpected change. The implications of more recent developments such as the general use of online mobile devices are still to be worked out. This mutability is especially true of the various O&O resources. For example, the way in which commercial MOOC providers operate now does not mean that this is the way they will operate in future. Their interactions with traditional higher education providers are similarly open to alteration. This report aims to capture the latest knowledge and opinion on these issues but recognises that the landscape of O&O resources will change, even as we write it. We have attempted to avoid technological determinism and to retain a focus on core educational aims.

Definition of OERs and MOOCs

Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs) share some characteristics, but they are very different in other respects, especially in their intended scale and in their interpretation of 'open'. For the purposes of this report, the Working Group has adopted the following definitions of OERs and MOOCs.

OERs (Open Educational Resources)

'Digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research' (OECD 2007).

Truly 'open' OERs meet the following criteria:

- freely available

- free of charge

- free to use

- free to re-use, adapt and distribute.

This is consistent with the definition at UNESCO's 2002 Forum on Open Courseware, which described OER as 'teaching, learning and research materials in any medium, digital or otherwise, that reside in the public

domain or have been released under an open licence that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions'.

The UNESCO definition was restated in the Paris OER Declaration adopted at the 2012 World Open Educational Resources (OER) Congress held at the UNESCO in Paris on 20-22 June 2012. This Declaration has been signed by the UK Government and includes commitments to foster awareness of OERs, support open licensing arrangements and, in particular, encourage the open licensing of educational materials supported by public funds.

MOOCs (Massive Open Online Courses)

'Massive open online courses are free, open access and scalable online higher education courses. MOOCs use a variety of online resources (such as videos and message boards) and seek to capitalise on high volume student classes by encouraging peer learning networks in place of more conventional synchronous learning and academic instruction. MOOCs may be developed more independently by academics or they may be developed as part of contractual agreements between higher education institutions and third party online platforms. They enable students to access high quality academic content and academics to engage with a much wider audience.' (Universities UK 2013)

MOOCs, as courses, are distinct from the simple provision of Open Education Resources and from the platforms across which MOOCs may be delivered. Coursera, Udacity and EdX are not themselves MOOCs but the courses which are supported on their platforms may be described as such.

To unpack the MOOC acronym:

Massive
Not all MOOCs will have huge numbers of learners enrolled, but they should be capable of enrolling large numbers. This has particular implications for the assessment and accreditation of MOOC learning: most HEIs would not have the resources to assess in a traditional way work submitted by thousands of learners on one course.

Open
Courses normally have open registration: there are no formal entry requirements and anyone may sign up. What 'open' does not mean is that the course materials are published as OERs, that is, available for re-use, adaptation and distribution. In this respect they are very different from OERs.

Online
Course materials and activities are published on the internet and this is also where some or all learning activities take place.

Courses

Courses are structured learning pathways which have an end point or deadline, and usually some recognition of completion or success.

The history of OERs and MOOCs

The use of online networks to share educational materials is of long standing, and for many years HEIs have published learning materials, now labelled OERs. They are typically the product of teachers in an institution producing teaching and learning materials and then making them available online for use and re-use by others outside the institution. In the UK Jisc has operated programmes to promote such materials since 2002 (currently the 'Open Educational Resources' programme). Jorum, a central repository for storing them and making them available to educators, was established in the same year and now holds over 16,000 objects.

For higher education institutions the decision by the Massachusetts Institute of Technology in 2002 to publish course materials online through the MIT OpenCourseWare initiative was a pivotal moment. The MIT OCW project initially released around 32 courses as OERs under Creative Commons licences in 2002, rising to 900 courses in September 2004 and 2,100 courses by 2013. The initiative has made use of YouTube and iTunes as platforms for sharing resources and is credited with having inspired other institutions to adopt similar approaches. The UK's Open University followed by launching its OpenLearn project in 2006 (it also provides free content on iTunesU and YouTube). Both projects were supported financially by the William and Flora Hewlett Foundation

In 2006 Salman Khan begin publishing tutorials online. The Khan Academy received charitable donations from Google, the Bill and Melinda Gates Foundation and others, and went on to expand the free publication of video recorded lectures, to the accompaniment of speculation, for example by commercial educational interests, about the death of the college lecture. The Khan Academy's YouTube channel now has over 1.3 million subscribers and over 293 million views. The channel has competition from Apple's iTunes U platform, which was launched in 2007, and provides free online access (to iTunes account holders) to downloadable education resources in a range of media formats.

The MOOCs movement began in Canada. It emerged from the OER movement, but aimed to produce whole courses rather than individual resources. It was founded on connectivist principles which valued the sharing of knowledge through peer interaction. These courses are now referred to as 'cMOOCs'.

The term MOOC was first used in 2008 by Dave Cormier to describe a course run by George Siemens and Stephen Downes on 'Connectivism and

Connective Knowledge'. It was later used widely in reference to a Stanford course led by Sebastian Thrun, 'Introduction to Artificial Intelligence', which attracted over 160,000 participants.

In 2012 two new organisations, both founded by academics from Stanford University, began offering online learning platforms for the delivery of MOOCs developed by partner universities and based on a more didactic model of knowledge transmission. Both organisations received substantial venture capital investment and operate on a for-profit basis:

- *Udacity*, led by Sebastian Thrun, has mainly specialised in technology subjects, co-designing courses with Google, NVidia, Microsoft and other companies. In 2013 the company began offering courses which could be awarded college credit in partnership with San Jose State University. However, the university later suspended the online courses when large numbers of students failed their final exams.

- In April 2012, *Coursera* signed agreements with four US universities (Stanford, Princeton, University of Michigan and University of Pennsylvania) to deliver courses developed by each university on Coursera's learning platform. By June 2012, some 690,000 learners were reported to have used the platform (1.6 million course enrolments) and by autumn 2012 Coursera were offering around100 courses in partnership with 33 higher education institutions. The University of Edinburgh became the first UK university to sign up with Coursera in 2012.

In addition, MIT and Harvard University launched their MOOCs platform, EdX, in May 2012. It is reported to have 1.2 million users. *EdX* operates on a not-for-profit basis.

Despite their differences the Udacity, Coursera and EdX MOOCs all offer courses based on a traditional didactic model, with tutors or lecturers imparting knowledge to students, and with varying levels of peer interaction. These courses are described as xMOOCs, although the term is also applied to the platforms.

All of the three main MOOC providers are based in the US, although their participating institutions may come from overseas. In the UK the Open University launched in September 2013 a new platform, FutureLearn[1], through a wholly-owned company, with the participation of contributing organisations within and outside higher education.

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[1]. www.futurelearn.com/

Use and users

It is not easy to evaluate the use and benefit of O&Os with any precision. OERs are by their nature freely available for anyone to reuse or redistribute without the obligation to inform the originator. It is therefore difficult to track the total number of visits to OER sites except insofar as one may log hits on OERs lodged in repositories like Jorum or visits to 'fixed' versions of OERs such as those on iTunes. The Open University reports 5.2 million visits to OpenLearn, 2.4m video views on YouTube and 1.7m visitors to iTunesU (global unique visits) in 2012–13.

It is even more difficult to gauge the educational outcomes or benefits of individual OERs.

For MOOCs there is a paucity of published data about which learners register to use platforms like Udacity, Coursera and EdX, why, and for how long. One study carried out at the University of Edinburgh, a Coursera partner, found that:

• 70.3% of participants in a Coursera courses had already achieved an undergraduate or postgraduate degree (30.1% undergraduate level, 40.2% postgraduate)

• 21% of the active learners on MOOCs were awarded 'Statements of Accomplishment' (having submitted at least one assignment).

The first of these findings is consistent with a larger dataset from Coursera, which indicates that 43% Coursera course participants held undergraduate degrees and 37% held Master's degrees or higher. However, the completion rate for the Edinburgh courses may be unusually high: other research indicates that a completion rate between 5% and 15% is the norm, though in absolute terms the number of completions may still be substantial. Learners may also have a variety of intentions when they commence a course, including 'trying out' the MOOC model and 'dropping in' for specific elements of the course.

The lack of published data does not mean that data is not collected by Coursera and others. Indeed, a wider variety of data on online activity by learners is routinely collected and analysed by MOOC providers in order to enhance course delivery; this is referred to as 'learning analytics'.

Business models

Given the very significant investment in the xMOOCs companies ($60 million for EdX alone), it is not surprising that they have been exploring new ways to monetise their operations, whether for profit, to generate funds for core educational purposes, or to simply recover their costs.

No definitive business model for xMOOCs has yet emerged and there is some scepticism amongst commentators about whether such courses will prove cheaper than alternative modes. The income streams which could enable cost recovery, either to the MOOC platform provider or to its academic partner, include:

- platform access fees, for institutions and students

- charges for textbooks, and other online or printed course materials

- charges to users for completion certificates

- secure assessment

- employee or university screening

- human tutoring or manual grading services

- advertising.

A business model that includes assessment and accreditation offers particular interest, as well as a number of challenges. Arguably, the ultimate aspiration for a MOOC is to be able to offer transferable university credit to learners who successfully complete their courses. Edge Hill University is experimenting with this approach for one of its MOOCs[2].

MOOCs have not yet, however, become widely recognised as providing learners with accreditation granted by recognised higher education institutions. In the UK universities are committed to the QAA Quality Code, which would apply to courses offering university credit: conformity with the Code would place considerable requirements on MOOC providers to support students.

Uncertainty about business models is but one of a number of uncertainties surrounding the future of MOOCs. Though they may not at present constitute a revolutionary disruptive force, they have added a new dimension to educational modes in higher education, and together with OERs they demonstrate the many future potentials of open and online learning. In the next chapter we summarise current activity in this area within Wales before turning to how some of the potentials could be realised.

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[2]   www.timeshighereducation.co.uk/news/spooky-mooc-will-offer-degree-credits/2003651.article

4   Open and online resources in Wales

This chapter gathers evidence for current O&O activity in Wales and attempts an assessment of the threats to and opportunities for Welsh institutions. More detailed information and full references will be found in the Background Paper.

HESA data show that in the academic year 2011–12 there was a total of 140,450 undergraduate and postgraduate learners enrolled in all Welsh higher education institutions, including the Open University. Students pursuing courses through distance learning number 11, 955; of these over 8,000 are enrolled with the Open University in Wales. The OU students are mainly at undergraduate level but those studying in the other institutions are mainly postgraduate.[3]

Open educational resources are not entirely new to Wales. Content provided by the Open University and promoted by its arm in Wales on the OpenLearn, iTunesU and Youtube platforms is well used by learners. In 2012–13, for example, there were 96,000 visitors to OpenLearn using a Welsh IP address.

The University of South Wales also provides free downloadable material on the iTunesU platform. More than 400 items are available, which have been downloaded over 2m times since the service was launched in March 2010.

The Working Group sought through informal consultation and its own research to establish the extent and nature of *online* (not necessarily *open* online) course provision offered by higher education institutions in Wales. As might be expected, the Open University dominates the provision of online higher education in Wales as in the UK, offering around 600 modules at undergraduate and postgraduate level across almost all disciplines. In the remaining Welsh HEIs we identified at least 104 different courses, in addition to 25 courses which are offered to registered users of Y Porth.

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[3].   Internal estimates for visits from Wales to the OU's iTunesU and YouTube content for that year are 10,000 32,000 respectively.

Y Porth

The main aim of the Coleg Cymraeg Cenedlaethol[4] is to increase, develop and broaden the range of Welsh medium study opportunities at universities in Wales. Online learning is a key part of its agenda. 'Y Porth'[5], a collaborative e-learning platform launched by the Coleg in 2009, hosts an extensive pool of Welsh medium electronic materials on a wide range of academic fields.

The main platform used by 'Y Porth' is *Blackboard Learn*, supported by *MediaCore*, a multimedia digital library platform for hosting collections of resources including video, audio and electronic publications. 'Y Porth' contains hundreds of university modules developed by lecturers funded through the Coleg's Academic Staffing Scheme, 22 publicly accessible open-access electronic resources (OERs) and courses, and a further 43 available to those who have registered on the site. Registration is free for the 700 Welsh-medium university staff and 1,500 registered students. The Coleg also hosts several key open resources, including study materials for its new Welsh Language Skills Certificate, on its *Apple iTunes U* site[6], and freely available e-book publications on the *Apple iBookstore*.

These figures, though they are almost certainly incomplete, do not point to a high level of current activity in Wales. They do, however, lend themselves to some general observations:

- with the exception of the Open University online learning coverage in Wales tends to be limited to a number of specialist areas in which the institutions may have particular strengths

- courses are almost all accredited, most frequently at postgraduate level

- online learning is seen as most appropriate for learners with prior higher education experience (the Open University being an exception).

These observations apply equally in England, according to research by White et al. (2012)[7].

In summary, the evidence shows that, although most Welsh HEIs have limited experience of designing and producing OERs, some of them are active in this field, and that there is demand for their resources – indicating both an institutional commitment to innovation in online education and some capacity to design and offer open and online resources of all kinds to students.

4. www.colegcymraeg.ac.uk
5. www.porth.ac.uk/en/
6. https://itunes.apple.com/gb/institution/coleg-cymraeg-cenedlaethol/id510769933
7. http://jisc.ac.uk/whatwedo/projects/hefcetaskforce.aspx

The Working Group was asked to look at collective action by Welsh higher education institutions to use technology in order to maximise economies of scale.

The Coleg Cymraeg Cenedlaethol, which operates collaboratively through all HEIs in Wales, has already been mentioned. Its 'Porth' brings together Welsh medium digital educational courses for the benefit of all its registered students across Wales.

In 2013 Higher Education Wales has recently brought together an Expert Group, chaired by Prof. Clive Mulholland, to lead activity on Open Educational Resources (OER) and Open Educational Practice (OEP) on behalf of the whole sector. The Expert Group is developing a portal that has clear potential for marketing online provision in Wales, as well as contributing to the Group's wider aspirations for building and maintaining Wales' open education reputation, 'challenging the way learning and teaching is delivered and enhancing the student learning experience for all students in Wales'. The Expert Group's proposed 'sMOOC' guide to university life is potentially significant as an early exemplar of collaborative action by Welsh HEIs, in conjunction in this case with the National Union of Students Wales, to build open online courses of relevance inside and outside Wales.

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HEW Expert Group on open learning

The Expert Group is developing a short MOOC (sMOOC) aimed at students in transition to higher education. It will act as a simple guide, helping them to anticipate their experience, cope with any issues, and get the richest experience of university life. The sMOOC is supported by the entire Welsh HE sector and is being developed in partnership with students. It is expected to be launched in September 2014 and could act as a focus for future collaboration.

Second, the Group plans to bring together links to the open resources which constitute the Welsh HE 'offer' into a single online portal. The portal will direct users to universities' own websites, where they will find learning resources relevant to their own learning and to the Welsh context.

Third, the Group has identified the area of enhancing digital literacy as a key area for staff development and will be working with Jisc, HEFCW, HEA and other agencies to build on the achievements of the Gwella programme, and to develop the sector's capacity to create, modify and use a wide range of online resources in online, classroom and blended contexts.

Another project of interest is the development of a web portal by the CADARN Group of higher education institutions which will both promote technology enhanced learning and support access to bilingual learning.

CADARN Learning Portal

The CADARN Group[8], supported by HEFCW, is currently building a web portal to showcase, promote and facilitate technology-enhanced learning, and to support access to bilingual learning. Aberystwyth University is co-ordinating the partnership, which includes staff from Bangor University, Glyndŵr University, Grŵp Llandrillo Menai, and the Open University in Wales.

The Learning Portal will showcase materials created by the e-learning teams within the network. Potential students will be able to locate learning materials based upon their location, available transport, language and learning requirements, leading them to resources which represent the best of current technology enhanced learning from the network. The Learning Portal will establish a mobile media production team which will support staff in HEIs to produce high quality shareable learning resources. Additional support in the form of loanable equipment and media production space will be made available at each institution.

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[8]. www.cadarn.ac.uk

Finally, Cardiff University is one of the partners in the Open University's recently launched FutureLearn initiative, and will be contributing one MOOC as part of its first phase[9].

In summary, while existing online provision in Wales may be sporadic and, with the exception of the Open University, on a small scale, the existence of 'Y Porth', the initiatives of Higher Education Wales and the participation of Cardiff University in FutureLearn testify to the active interest in both online and open learning in Wales, in particular on a collaborative basis.

Whilst it seems unlikely that there will be additional large-scale government funding for OERs and MOOCs in Wales, there are a number of strategic level developments which could be helpful in providing a framework for these activities:

- the Welsh Government's recent *Policy statement on higher education*[10], which includes a section on technology-enhanced learning covering current and potential future methods for delivering higher education courses online and blending traditional learning through various methods of study

- HEFCW's current Strategy for Enhancing Learning and Teaching through Technology is due to be revised over the coming year.

Threats and opportunities for higher education in Wales

Among the threats O&O resources, and particularly MOOCs, might in future pose to HEIs in Wales are:

- some of the new providers work on a global scale and could attract students, especially those unwilling or unable to pay fees, who might otherwise attend HEIs in Wales

- many institutions in Wales may lack the size and prestige to attract invitations to partner in the large-scale MOOC platforms

- institutions may lack the capacity and the skills to develop their own resources, or indeed to make effective internal use of O&O resources from elsewhere.

The Working Group's consultation with stakeholders across providers in Wales (see Appendix 3) included an invitation to respondents to identify potential barriers to O&O activity in Wales. The barriers reported included:

- the resources need to develop and deliver online resources, including technology infrastructure

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9. www.futurelearn.com/courses/muslims-in-britain
10. Welsh Government, *Policy statement on higher education*, 2013
http://wales.gov.uk/docs/dcells/publications/130611-statement-en.pdf

- the potential for reputational damage to the institution if MOOCs (in particular) were poorly delivered

- small institutions were unable to compete on a level playing field

- difficulties or uncertainties about intellectual property rights

- significant requirements for professional development of academic staff to assist them in developing online course material and supporting online learning activities.

The Working Group did not identify in the responses a strong sense that traditional higher education provision in Wales was threatened by the emergence of OERs and MOOCs. In general, the view prevails that the quality of the learner experience in MOOCs is no match for conventional (face-to-face or distance) higher education courses, that MOOCs may turn out to be a short-lived phenomenon (or at best, a modified and more outsourced form of existing approaches to blended learning), and that the campus experience will remain a significant factor of student life.

Considering O&O resources as they are today (see Chapter 3) the Working Group concurs with this assessment. However, it is impossible for anyone to forecast their future direction and fate with any certainty. All Welsh institutions should keep a watchful eye on O&O developments, to review any threats they may pose in future, and search for opportunities to act individually or collectively as learning requirements and business models evolve. The development of FutureLearn will be of particular interest, given that two universities in Wales are already involved in it.

Turning to opportunities, there is evidence from the consultation responses that at least some institutions in Wales will wish to engage actively in the systematic production of O&O resources, in order to gain some of the benefits they promise to bring. These benefits may include:

- widening participation

- recruiting more students, including from overseas

- encouraging partnerships (eg with industry, schools and further education)

- developing pedagogic practice.

They will therefore want to arrive at an institutional view of the place of O&O resources in their overall educational provision, and consider the practical steps needed to make provision a reality. Among the relevant considerations may be:

- infrastructure and learning platforms

- teaching methods, course design and resource creation

- assessment

- certification and awards

- staff skills development.

In addition to urging institutions to monitor developments and act individually according to their needs, we consider that there are number of specific opportunities to use O&O resources to support learning *on a collective, all-Wales basis*. These potential initiatives are all concerned, significantly, with the transition into and out of HEIs and other parts of Welsh society and economy. These proposals are discussed in Chapter 6.

5 Conclusions from research and consultation

Taking into account the evidence drawn from its research and the views expressed by those who responded to its informal consultation the Working Group drew the following conclusions:

1. Open and online resources as they are today have evolved over ten years or more. OERs have a lengthy history, and MOOCs, although they may appear to have to have burst upon the scene suddenly, are similarly the product of a period of evolution.

2. O&O resources remain in a state of flux. It is extremely difficult to be certain about the directions they will take in future. It is clear, however, that they have the potential to offer more flexible and possibly cheaper learning modes that take advantage of ways of learning and communicating that are familiar to students.

3. Existing educational provision based on O&O resources is relatively limited within the higher education sector in Wales, although there are a number of nascent collaborative schemes. 'Y Porth' offers the opportunity to extend 'online' to 'open and online', and Cardiff University is a partner in the Open University's FutureLearn venture.

4. Even though MOOCs may not currently pose an imminent threat to the interests and practice of institutions in Wales, it would be wise for institutions to monitor their development closely, and take an explicit policy view on the part all O&Os will play in their learning provision.

5. O&Os offer a number of opportunities for HEIs to develop their learning provision as well as enhance other activities, including widening access to higher education and contributing to meeting the skills requirements of the Welsh economy and Welsh society.

6. O&O resources lend themselves to a partnership approach, both within the institution and between institutions, in order to share skills and costs, and create a larger impact. Wales is a small and distinctive enough country to use partnerships with alacrity and to good effect.

7. The desire to share knowledge freely is an example of Wales's distinctiveness, and some types of O&O resources offer the opportunity to share educational resources openly and freely beyond the walls of the originating institution.

The next chapter builds on these conclusions to discuss and make recommendations on actions to be taken within Wales to take positive advantage of the opportunities.

6 Proposals for action and funding

Open and online resources appear to offer powerful means of extending the benefits of higher education. This chapter offers answers to the question, how can institutions in Wales, individually and collectively, take advantage of the opportunities available?

First of all, the planning of any O&O course or resource should be founded on a number of important design principles:

- **Clarity of purpose** Institutions may embark on O&O ventures for a number of possible reasons: to save money or increase income, to recruit more students, to extend the educational experience of students, to develop the pedagogic skills of staff, or other reasons. It is vital that the motivation for the initiative is made explicit from the beginning (even if unexpected effects emerge later). More generally institutions should make it clear in their published policies and strategies what overall position they take on O&Os.

- **Quality and standards** O&Os, simply by virtue of their high visibility, are important to the reputation of the institution. Even if the quality standards relevant to a conventional HE course do not apply it is important that O&O courses and resources comply with a set of criteria defined at the outset. These should include standards on accessibility, provision of relevant pedagogical information to prospective learners, the nature of any support offered, and how learners are able to feedback on their experience. This list is not exhaustive; careful attention should be given to establishing and maintaining a high quality learner experience within any O&O venture. Learners should be included in the planning and design of O&Os.

- **Skills and resources** The production of O&O resources calls for particular educational, technical and organisational skills to be combined, often from different parts of the institution and beyond. Institutions should consider how to develop staff skills in this area, and not underestimate the staff time required to design and support high quality O&O resources. Beyond assuring the supply of these resources an institution should consider the wider question of whether a commitment to online learning implies a more fundamental shift in pedagogy within the institution towards ICT-based forms of learning.

- **Transparency with learners** O&O learners have a right to know how data collected about them will be used by the institution or host platform. To this end clear information on privacy and intellectual property policies should be provided, and any changes in terms of service should be

clearly communicated. Learners should be given clear explanations of the financial implications of their choices prior to enrolment, including any cost associated with the formal certification of their participation.

- **Partnership possibilities** O&O resources,even if they recover costs through the large scale of their operation, can be expensive to design and deliver. HEIs should consider partnership options, for example to provide a technical platform or help with promotion. Partners may mean the large-scale platforms such as the Open University's FutureLearn, or more local or *ad hoc* alliances, or might extend beyond higher education to schools and further education, or to employers.

The Working Group considered how O&O resources might lead to effective outcomes when planned on an all-Wales basis (both collectively and collaboratively).

We do not believe that it would be desirable to fund centrally the construction of an 'all-Wales MOOC platform' or similar national infrastructure to parallel the Welsh schools Hwb service[11]. Such platforms are already in wide, indeed global use, and it would be expensive and risky to develop and maintain a Welsh platform. Moreover, Welsh HEIs as autonomous organisations are able to take their own decisions about appropriate platforms.

We have, however, considered in detail the case for concerted action in the application of O&O resources to three particular areas of educational policy:

1. Widening access to higher education to those with low participation backgrounds

2. Developing skills for the workplace and the Welsh economy

3. Developing Welsh language skills for employment

We have also considered what actions higher education institutions could be encouraged to take, individually or in concert, to make the most of the opportunities afforded by the development of O&O resources:

4. Reviewing institutional policies, monitoring developments and exploiting opportunities

5. Strengthening institutional reputation and brand

And finally two enabling proposals are directed to both the Minister and to the institutions:

6. Improving the skills of higher education staff

7. Licensing and sharing open educational resources.

[11.] https://hwb.wales.gov.uk/home/Pages/Home.aspx

1   Widening access to higher education to those with low participation backgrounds

A commitment to social justice features prominently in Wales's approach to higher education. The Welsh Government identifies widening access as a priority. Its *Policy statement on higher education*[12] published in June 2013 highlights key areas for future widening access initiatives, including (a) underpinning provision with HE-related information, advice and guidance to promote higher education, higher-level learning and higher skills, and informed decision making; (b) ensuring that modes of provision include the Welsh medium, flexibility, community- and workplace-based outreach, and bite-sized learning appropriate to learners of all ages, and (c) supporting higher education in further education, in the workplace and digitally.

All universities in Wales are developing initiatives to increase participation from students in Communities First areas. The sector's work in this area also benefits from the Reaching Wider initiative, established by HEFCW in 2002[13], which aims to increase participation in higher education, focussing on specific target groups, for example, residents of Communities First areas and those who wish to study through the medium of Welsh. The initiative involves all the HEIs and FEIs in Wales (including the Open University), in partnership with local authorities, schools, voluntary sector bodies and Careers Wales.

O&O resources represent a significant opportunity to engage groups from low participation backgrounds in higher education, providing appropriate support and guidance is available. The main advantage of the medium is its ability to bring experience of higher education material directly to non-traditional learners; demystifying the content and challenge of higher education material could be beneficial to raising aspirations. Resources could be used in two contexts: in schools, and with adults returning to learning. In both cases it will be essential that support is available to help learners make the most of O&O resources: evidence shows that unsupported O&O resources are used mostly by those who are already familiar with learning at a higher education level.

Learning pathways from schools and colleges to higher education

A recent study of the use of open educational resources in European higher education pointed to the following conclusion:

> There needs to be better collaboration between the various stakeholders if OER are not to be seen as a way of simply widening

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12. http://wales.gov.uk/docs/dcells/publications/130611-statement-en.pdf
13. www.hefcw.ac.uk/policy_areas/widening_access/reaching_wider_initiative.aspx

the audience for higher education knowledge rather than widening participation in formal studies.[14]

Partnerships between local schools and colleges[15] and HEIs could support the development of O&O resources for raising the aspirations of learners from Communities First Areas.

Working together with local schools and colleges HEIs could develop a range of O&O resources linked with curriculum subject areas. Collaboration between academic staff in HEIs and teachers in local schools and colleges would be critical to ensure these resources are developed at the appropriate level and, importantly, in a way that allows teachers to integrate them successfully into classroom activity or broader career development education. Linked to curriculum areas these resources would display how the exploration of a subject expands within higher education and, with appropriate learner support, demonstrate that success at this level is achievable. Use of appropriately developed assessment and feedback strategies would encourage continuation; many existing MOOCs rely on the use of peer assessment, which may not be appropriate within this specific context.

All resources developed between HEIs and schools and colleges would be hosted on the Hwb platform available to all schools in Wales. Hwb is the all Wales learning platform for learners aged 3 to 19, which is to be rolled out to all schools in Wales by summer 2014. The site encourages the sharing of digital learning resources developed by teachers from across Wales, and also hosts distinct 'Collaboration Areas' where learners can discuss and interact with digital learning resources collaboratively with their peers and teachers. The Hwb platform lends itself to the hosting of O&O resources suitable for schools and colleges, and presents an ideal opportunity to bring content from universities to learners who may require encouragement and support in considering higher education. It might also be used to enable broader access; the key to enabling this would be an open licensing policy.

Co-ordination between HEIs in the development of these resources would be beneficial to ensure a comprehensive spread of subject areas. We recommend that activity in this area is channelled through a region's Reaching Wider Partnership, to avoid the unnecessary establishment of new partnership networks for HEIs and schools and colleges. HEFCW has recently reaffirmed the importance of Reaching Wider for widening access work in Wales[16]. Using the Partnerships to develop O&O resources, tailored to raise the aspirations of those from low participation backgrounds, could further develop Wales' widening access work.

14. Lane, A. and Van Dorp, K. J.,' Open educational resources and widening participation in higher education: innovations and lessons from open universities', in: EDULEARN11, the 3rd annual International Conference on Education and New Learning Technologies, 04–05 July 2011, Barcelona. http://oro.open.ac.uk/29201/

15. We use the term 'schools and colleges' as shorthand for all compulsory education up to higher education level.

16. Reaching Wider Strategy Allocations 2013/14 www.hefcw.ac.uk/documents/ publications/circulars/circulars_2013/W13%2019HE%20Reaching%20Wider%20 strategy%20allocations%20for%202013_14.pdf

Pathways for adult learners

Engaging learners from low participation backgrounds in higher education should not be limited to those of up to 19 years old. People of all ages can enter higher education via a range of pathways, including those provided by FE institutions, Adult Community Learning (ACL) partnerships, Work Based Learning, and the voluntary sector. Recent mergers and partnerships have played a major role in creating efficiencies while sustaining diversity. There is also evidence of the growing capacity of providers of adult education to engage with the creation and use of online (but not necessarily open) learning resources, for example the PADDLE project on digital literacy in North Wales[17]; the Motivate project on mobile learning at Coleg Gwent[18]; the TRIO project at Swansea[19] and the ReCITE project in South West Wales[20]. Increasingly, online courses are migrating from projects and becoming part of standard provision, particularly in FEIs and HEIs. Colleges who have most experience in this area may be well placed to produce open and online resources and courses.

One example that combines specifically open resources (OERs) with outreach work is a joint project undertaken by the Open University and the Reaching Wider Partnership in north and mid Wales. This project seeks to increase the use of OpenLearn, the Open University's open educational resource site, and other OERs, amongst adult learners within Communities First Areas[21]. The programme trains 'champions' in a range of sectors who promote OpenLearn resources and encourage adult learning within low participation communities. An evaluation of the project has found that the value of OERs to individual learners was highly dependent on the context in which they operated, and that the 'champions' had a valuable role to play in ensuring that relevant resources were presented in an engaging way. Learners are often accustomed to working socially, and the project outcomes indicate that they should be offered opportunities to learn in groups, either formally or informally. The work has been well received by community members who have engaged with the programme and evaluation of the project has identified areas for future development. We are encouraged by this work and its positive contribution to expanding the audience and benefit of O&O resources to learners from all backgrounds and ages.

Providers of adult education services will also need to consider the implications of open and online learning in the context of articulation. Certification via MOOCs is contentious, but HEIs can exercise more flexibility when it comes to student intake, especially where the intake may help them to reach Widening

17. www.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies/paddlellandrillo.aspx
18. http://ilt.coleggwent.ac.uk/swani/
19. www.swansea.ac.uk/dace/wideningparticipation/thetrioproject/
20. www.jisc.ac.uk/whatwedo/programmes/elearningcapital/reproduce/recite.aspx
21. www.open.ac.uk/blogs/OpenLearn_in_North_and_Mid_Wales/

Access targets. This could greatly expand the use of pathways which have already been established under the Credit and Qualifications Framework Wales (CQFW)[22]. This wider approach to certification would also allow the core ACL providers to engage with those in the voluntary sector and the trade unions, where there is a growing interest in this area.

Recommendations

- Fund the development of O&O resources for use in schools and colleges, with the aim of raising aspirations of learners from low participation backgrounds. This scheme should be co-ordinated through collaboration between HEIs and schools and colleges in their region, via existing Reaching Wider Partnership networks.

- Investigate the use of Hwb as a host for the O&O resources developed, with the intention of establishing a central repository where all schools and colleges may access these resources.

- Extend the work of the Open University OpenLearn Champions project to cover the whole of Wales via the Reaching Wider Partnerships.

- liaise with NIACE Dysgu Cymru, Agored Cymru, and others to align O&O resource production with the needs of adult learners pursuing agreed progression routes, including CQFW.

2 Developing skills for the workplace and the Welsh economy

There has long been recognition of a significant skills gap in the UK and the Welsh workforce. The UK Treasury's Leitch Report[23] (2006) and the Welsh Government's report *Skills that work for Wales*[24] (2008) highlighted that fact that the UK, and Wales in particular, lag behind international competitors in employment skills. More recently, the UK Commission for Employment and Skills showed that 28 per cent of Welsh employers reported a skills gap within their workforce with 35 per cent of managers and professionals in Wales lack an "appropriate" formal qualification[25]. The gap is particularly profound for the Valleys region, and the University of the Heads of the Valleys Institute was established in 2009 partly in response to these reports. The Working Group recognises this initiative and the many others where technology is used to support learning and skills, with direct or indirect

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22. http://wales.gov.uk/topics/educationandskills/qualificationsinwales/creditqualificationsframework/?lang=en

23. HM Treasury, *Prosperity for all the global economy: world class skills*, 2006 www.hm-treasury.gov.uk/d/leitch_finalreport051206.pdf

24. Welsh Government, *Skills that work for Wales*, 2008 http://wales.gov.uk/topics/educationandskills/publications/guidance/skillsthatforwales/?lang=en

25. UK Commission for Employment and Skills (2011) Skills for Jobs: The National Strategic Skills Audit for Wales 2011

relevance to business and the workplace. Here we focus mainly on a discussion of the value and potential of online (but not necessarily open) learning in these contexts.

Computer assisted learning focused on the development of vocational skills is by no means new. In 1998 the UK government established the University for Industry (UfI) which provided computer based courses under the 'Learn Direct' brand. This altered the mode of provision radically in some parts of the curriculum, and some geographical areas. Following the withdrawal of UK government funding in 2010 and the establishment of UfI as a charitable trust, these courses are still available, at a cost. Some of them are online, but none are open. Providers buy these courses annually in bulk, and charge learners as they re-sell them. In the longer term, it is possible that this business model will change in the face of competition from free online resources.

More recent technological and economic developments may help to tip the balance in favour of online, and possibly open, learning in and for the workplace. Access by working people to digital infrastructure (broadband networks) and devices (laptops, tablets and smartphones) is constantly improving, and the technologies are developed enough to support multimedia and interactive learning. (It should be noted, however, that inequalities in access to those same assets, as well as deficits in skills and confidence, still persist.)

In this context O&Os may offer the potential to enable people of any age and in any location to follow courses and develop new skills, with clear advantages for work-based or work-related learning. This may be especially the case for SMEs, where skills development is a resource-intensive activity and needs mechanisms that make it easier for employers to involve their employees in training[26], although there are specific challenges for both employers and employees in terms of facilitating e-learning adoption and assimilation within the organisation[27]. (In fact, a more blended approach would be more relevant to SMEs, that is, one that combines both online and face-to-face learning[28].)

OERs offer the employer a suite of course materials that can be re-used alongside tests and quizzes, while MOOCs offers a framework of video lectures, peer assessments and a certificate of completion: a medium well suited to enhancing learning and training within a corporate setting. Closed online courses provide a third way that combines the flexibility of distance learning with the structure of a standard programme of study. These models

26. www.oecd-ilibrary.org/industry-and-services/skills-development-and-training-in-smes_9789264169425-en

27. Raymond, L., Uwizeyemungu, S., Bergeron, F. and Gauvin, S. (2012) A framework for research on e-learning assimilation in SMEs: a strategic perspective, European Journal of Training and Development, Vol 36 (1) pp.592-613.

28. www.westga.edu/~distance/ojdla/summer52/goolnik52.html

can have varying benefits in their appeal to individuals seeking flexible pathways, to organisations seeking to enhance employee skills, and to professions, especially at a postgraduate, executive or post experience level[29] (across the UK generally there is a growing body of evidence that some sectors, most notably the NHS, are making wide use of OER and open practices[30]). All three models have distinct advantages.

O&O resources also have the potential to play a key part in the raising of standards and outcomes in Wales. The success of developments such as 'flipped classrooms' depend on having access to high quality open teaching resources. More generally, the opportunities for O&O resources to be a driver for 'better' education rather than the tendency to focus on 'more', should be embraced.

There may, therefore, be an opportunity for Wales, through its HEIs and FEIs, to improve substantially the provision of education and skills to individuals and organisations through the adoption of an online learning approach to its skills development agenda. A strategy to develop a suite of high quality OERs may present an important starting point for cost-effective flexible provision. Alternatively, MOOCs may offer a significant opportunity to advance and recognise skills development, to the benefit to individuals, communities and organisations alike. Working in partnership with employers will be an essential in securing joint commitment and joint resourcing of an initiative to invest in the economic and social wellbeing.

The first step, however, is to improve awareness. The Working Group engaged in discussions with key stakeholders from industry in Wales. CBI Wales informed us that it has supported the UK Government's Department of Business, Innovation and Skills in the development of strategies in this area, specifically by hosting a round-table discussion of stakeholders. The CBI is also aware of the enthusiasm of some FE and HE stakeholders for open and online learning, and is generally supportive of these developments. However, there is no reference to online learning in its recent publication *Tomorrow's growth: new routes to higher skills*[31], which indicates that an understanding of the potential may not yet be embedded in current strategy. Individual businesses we consulted were largely unaware of key developments in online learning.

Raising awareness of online learning options amongst employers, in private, public and voluntary sectors alike, is therefore an essential preliminary to action. This should lead to a dialogue between key stakeholders,

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29. http://www.charteredaccountants.com.au/~/media/Files/News%20and%20media/Reports%20and%20insights/021328%20CC_Virtual%20University%20Publication_WEB_FA3i.ashx
30. www.jisc.ac.uk/media/documents/events/2010/07/MeganQuentin-Baxter.pdf
31. www.cbi.org.uk/campaigns/skills-for-growth/tomorrows-growth-report/tomorrows-growth-report-page-turner/

establishing in the first instance areas where industrial and public sector partners would be best placed to benefit from online provision.

This discussion also needs to consider the various ways in which learning could be recognised and authenticated (through informal systems as well as formal accreditation). Employers may struggle to differentiate between the learning outcomes of the varying emerging models, in addition to grappling with differences between face-to-face and online programmes more broadly.

The stakeholders in such discussions would include business organisations such as the Confederation of British Industry, the Federation of Small Businesses and the Institute of Directors but also the various sector panels established in Wales to drive forward the economic development aims of the Welsh Government[32]. This could ensure that open and online learning can be made relevant to the individual needs of the nine key sectors currently supported in Wales.

The financing of a programme to promote online learning for employment in Wales could be derived from European structural funds. The current round of the European Social Fund ends in 2013 and a formal consultation in preparation for the period 2014-2020 has recently been completed[33]. In its consultation response Higher Education Wales stresses that 'the development of regional human capital and skills to drive the economy in Wales is dependent on our HEIs'[34]. However, whilst HEIs have developed individual online learning programmes for the private sector which have been funded in the past, there has been no comprehensive or strategic approach to utilising online learning as a key delivery tool for training and skills programmes funded through ESF. In fact, major programmes of skills development that are managed by HEIs, such as Leadership and Management Wales, currently have no mechanisms for online delivery of their courses. There may be an opportunity here to alter this state of affairs.

Recommendations

- Develop a strategy, working with other agencies, to raise awareness of the potential for online learning to support economic development.

- Use the Welsh Government's sector panels to foster dialogue between stakeholders (including educational providers and employers) in order to identify opportunities to develop skills using online resources.

- Examine how online learning should be integrated into the approach for programmes funded through the European Social Fund.

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32. http://wales.gov.uk/topics/businessandeconomy/sectors/?lang=en
33. http://wefo.wales.gov.uk/news/latest/130115consultation/?lang=en
34. http://wales.gov.uk/docs/det/consultation/130726response52highereducationwalesen.pdf

3 Developing Welsh language skills for employment

Welsh language skills is an area ideally suited for the development of a higher level MOOC for use by students and in the workplace.

The Working Group has identified a number of potential partners who could deliver such a MOOC, which would not only be attractive to current HE students but far more broadly to employers and work-based learners alike. The development of such a MOOC would support the Welsh Government's strategies on the Welsh language, economic development and skills and provide a progression route for advanced learners to develop their skills and to potentially seek certification to demonstrate these skills to potential employers. As such the MOOC would be at a higher level than the resources currently available to support learners at an early stage of Welsh language learning, and offer a suitable progression route for those learners.

The application of open learning to this area would confer several advantages:

- courses would be more visible to potential learners and employers

- learners could work flexibly, at any time and place, and according to their own timetable

- employers would also welcome the flexibility of delivery

- learners from all over the world could take advantage.

A Welsh Language Skills Certificate[35] was launched by the Coleg Cymraeg Cenedlaethol in 2012 to fulfil a demand by employers in Wales for a formal national certificate which demonstrates high attainment in Welsh language skills, suitable for professional use within the workplace. The certificate offers one of several potential bases for delivering a Welsh language skills MOOC for learners beyond the Welsh-medium university sector. Over 40 candidates successfully completed the course in May 2013. It has been formally recognised by over 200 employers including government and public sector bodies, companies of all sizes and social enterprises.

The enthusiasm of employers for the Coleg's certificate underscores the potential of a Welsh language skills MOOC. There are potentially large numbers of MOOC learners within the workplace, as well as independent learners who would benefit from additional upskilling of their Welsh language skills, with the potential option of a formal certificate at the end of the course. For example, a substantial number of staff could be encouraged to follow a Welsh language skills MOOC course from within bodies and companies developing Welsh language skills strategies, as well as staff from

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[35.] www.colegcymraeg.ac.uk/en/ourwork/welshlanguageskillscertificate/

within the further and higher education sectors and advanced adult learners who have completed the 'Proficiency' stage.

Other possibilities could include building on the work of the Sabbatical scheme and/or reflecting developments in Welsh for Adults teaching following the report *Raising our sights: review of Welsh for adults*[36], published in July 2013, and/or the development of diagnostic tools by the WJEC. All four pathways to Welsh language skills have proven significant demand. Before undertaking any further work an identification of the most appropriate pathway for development and detailed discussions with potential partners would need to take place.

Elements of the resources already developed in any one of the four potential pathways could be re-used and a range of courses could be developed with additional content for independent learners including elements tailored for developing language skills and terminology in key employment sectors e.g. healthcare, education, media, law, tourism and the environment. A successful higher level MOOC could also provide a model for other Welsh language skills provision, at different levels, to follow.

To establish resources suitable for independent learning within a MOOC there would need to be an initial investment in developing a number of audio and video clips and online tests and self-assessments in conjunction with suitably qualified academics or tutors. The detail of such plans would need to be discussed in detail with potential partners to secure the most effective fit between the provision already provided and the development of the MOOC.

A Welsh language skills MOOC lends itself ideally to an xMOOC delivery model, with 10-15 minute asynchronous video/audio sessions, supported by downloadable documents, each followed by online self-assessment tests to ensure there is suitable learner feedback as the learner progresses through the course. There could also be online forums with indirect learner support from peers. A further development could be tutor support, but this would be more resource-intensive.

The sustainability of any Welsh language skills MOOC would depend on an income stream to support its maintenance and development. There are a number of resources relating to Welsh language skills already in existence, but beyond an initial fairly substantial investment to create a suitable MOOC the ongoing costs could be met based on an enhanced examination fee-based model for learners outside the registered programme. This would depend on an inter-related course being the basis of the MOOC, e.g. the sabbatical scheme or the Coleg's certificate. One could quite reasonably expect hundreds of learners annually to seek a certificate having followed a suitably developed MOOC. This would also offer a suitable progression

[36]. http://wales.gov.uk/docs/dcells/publications/130712-review-welsh-for-adults-en.pdf

route for learners who have studied qualifications at other levels before engaging with the Welsh language skills MOOC.

Recommendation

Develop a Welsh language skills MOOC at higher education level so that students and work-based learners can develop their professional Welsh language skills and potentially seek certification for those skills.

4 Reviewing institutional policies, monitoring developments and exploiting opportunities

O&O courses and resources represent a challenge to the approach an institution takes to how it teaches and how its students learn. Among the questions that they pose are:

- what place should O&O resources have in the institution's own teaching and learning strategy?

- what purpose or purposes will O&O resources be used for?

- in which areas of distinctiveness could the institution focus its O&O activity?

- should institutional resources be set aside to develop them, and if so, how?

- should the institution enter into partnerships with other organisations to provide O&O resources, and if so, which ones?

- what benefits would students and potential students expect from O&Os, and what obstacles would face them?

- what role should students play in planning the use and development of O&O resources?

- how will high quality and standards be maintained in producing O&O resources?

- what view will the institution take of the certification of O&O courses?

- how can O&O resources and their production be aligned with internally-used ICT-based resources, e.g. through the use of hybrid modes?[37]

[37.] A full list of strategic questions is given in Stephen J. Marshall, 'Evaluating the strategic and leadership challenges of MOOCs', *MERLOT Journal of Online Learning and Teaching*, Vol. 9, No. 2, June 2013, p.216-227.
http://jolt.merlot.org/vol9no2/marshall_0613.pdf

The institution's education or teaching and learning strategy could be a suitable context for addressing these and other questions. If the institution decides to produce O&O resources it should ensure that they conform to the design principles already mentioned. HEFCW's 'Gwella'[38] project has laid down the basis for this by supporting HEIs in embedding e-learning into their strategic plans for learning and teaching, and thus including them in overall strategic plans. This work has been sustained and consolidated in the HEIs, as evidenced in HEFCWs Enhancing Learning through Technology (ELTT) Strategy[39], and its implementation review[40].

Institutions should monitor developments in O&O elsewhere, in the UK and the rest of the world, both for threats from online providers that could gain competitive advantage and affect existing or planned courses, and for opportunities to extend provision or gain additional students, and to partner with other organisations, including those outside higher education. Where these opportunities promise to benefit the institution and its students it should take full advantage of them, if appropriate in collaboration with other bodies, and in conformity with the design principles described at the beginning of this chapter.

Even if an institution decides against embarking on the production of O&O resources it should give thought to how O&Os from external sources might be used most effectively in their own teaching and learning practice, for example within the context of hybrid or blended learning.

Recommendation

Agree what the institution's overall approach to open and online resources should be, monitor external O&O developments, and exploit opportunities to produce and use resources.

5   Strengthening institutional reputation and brand

One of the most obvious roles of open and online resources is as a means whereby institutions can extend awareness of their own work to new national and global audiences. Such materials can act as a showcase, on a worldwide stage, for the best research, scholarship and education in Wales. In order to project a positive message that will enhance its reputation institutions (or the sector) must offer materials of the highest standard. They might wish to focus resources on distinctive areas: those related to Wales, or

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38.   www.hefcw.ac.uk/documents/policy_areas/learning_and_teaching/ gwellafinalreportpublic.pdf

39.   www.hefcw.ac.uk/documents/publications/circulars/circulars_2008/W08%20 12HE%20circ.pdf

40.   http://www.hefcw.ac.uk/documents/policy_areas/learning_and_teaching/ASPIRE%20ELTT%20 review%20report%20final.pdf

to areas of teaching or research strength. Each institution, however, will need to make a separate decision on the role O&O materials will play within its marketing strategy.

The use of O&O resources holds particular advantages for prospective international students, enabling them to experience 'taster sessions' of specific courses or sample a range of courses, and so helping them to decide which university to attend, before committing substantial sums of money. Such an approach may also help with the retention of international students, as expectations of a UK course may be more realistic as a result of their participation.

There is so far little compelling evidence that the use of O&O resources translates directly into increased recruitment. Issues related to overall reputation, funding, ease of application and visas are among the other factors that are likely to influence recruitment, particularly from overseas. Over time it is possible that the use of learner analytics could support more direct international marketing campaigns, but they are unlikely in the short term to replace concerted, targeted campaigns. Student retention is also best supported by robust, personalised student support services to cover the wide range of needs which international student present.

In the interim there is a potential role in aiding transnational collaborations, since this could result in more cost-effective methods of delivery, but such an approach is likely to be linked to credit bearing awards, which will require detailed due diligence and strong student support from the local providers. Transnational collaborations on online materials could lead to a reduction of pressure on existing physical spaces and resources in Wales if part of the course is studied overseas; however, as yet there little evidence to indicate whether the business and financial models are sustainable given the initial high input costs required to develop high-quality open materials. Recruitment into distance learning opportunities, using mixed and blended methods of online delivery, is a real possibility, but these would not be open in the sense of 'free', as the staff support required to ensure such courses are meaningful and successful is very expensive and would need to be funded.

The Expert Group of Higher Education Wales is planning an online resource with the aim of highlighting the best of online resources produced by Welsh HEIs, and a 'sMOOC' aimed at prospective students intending to come to Welsh institutions (see Chapter 4). Both these initiatives should be evaluated carefully, since if successful they could prove blueprints for similar collaborative ventures in future.

Recommendation

Exploit open and online resources in appropriate circumstances to showcase the quality of learning opportunities.

6 Improving the skills of higher education staff

To realise fully the benefits of open and online education staff need to have the skills and confidence required to make best use of digital tools and approaches.

Institutions wishing to develop O&O resources should consider how to ensure they possess the means to produce them successfully and to high standards. In practice this will mean ensuring that academic teachers and support staff are fully aware of the potentialities and practice of O&O courses, and are equipped with the basic digital literacy skills, including expertise on licensing of O&O materials. Depending on the depth of the institution's commitment to online learning this process may progress well beyond a 'tactical reskilling' to encompass a comprehensive rethinking of the role of the teacher and the learner in the digital age, shifting the emphasis towards 'open educational practice'.

Thinking about the practice of open online teaching will inevitably connect with thinking about more traditional on-campus ICT-based teaching practice, and indeed it is likely that a two-way fertilisation will occur: existing skills and methods will be migrated or adapted for use on open online practice, and O&O techniques will affect on-campus practice.

Institutions may also choose to assemble or adapt a central unit able to support teachers in the production of O&O resources, or join with other institutions to the same end (as in the CADARN project).

Institutions can support staff by offering training and development, either alone or with partners such as Jisc and SEDA, and ensuring that the work involved in developing and delivering online and open education is recognised and appropriately rewarded.

Responsibilities in this area do not lie wholly with the institutions: teaching staff also hold a duty to enhance their own skills in order to make the most effective use not only of O&O resources but all ICT-mediated methods of teaching and learning in higher education.

The Quality Assurance Agency for Higher Education will be reviewing this aspect of staff support in future institutional visits, and details of expected support are provided in section B3 of its Quality Code[41]. Significant research evidence exists to support activity in this area, not least that developed through Jisc's Developing Digital Literacies programme, which has promoted the development of digital literacies support for staff and students. HEFCW and the Higher Education Academy should take a lead on this agenda.

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41. www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/Quality-Code-Part-B.aspx

O&O resources are an increasingly fast moving and complex field, with a variety of concepts and products vying for attention. It is essential that institutions are offered the best possible evidence-based advice, and to this end we recommend that HEFCW continues to support the work of Jisc in this area. We also recommend that the Welsh Government works with Jisc on other projects in this and related fields, eg digital literacy.

Recommendations

- Institutions should provide academic staff with the skills and support they need to make most effective use of open and online approaches to learning.

- HEFCW should continue to contribute to the costs of Jisc's programme on open and online resources and take advantage of Jisc's expertise.

- HEFCW and the Higher Education Academy should take a lead on this agenda.

7 Licensing and sharing open educational resources

There is potential to increase the sharing of resources within, between and beyond Welsh HEIs, which could lead to more efficient use of staff time, inclusion of wider groups of learners and enhanced quality of the student experience. Managers in HEIs are aware of this potential, but have until now encountered significant intellectual property barriers to realising these gains. The causes of the barriers are complex, and include

- an unduly competitive environment, which encourages exclusive ownership and usage

- the lack of a supportive culture in order to develop open practice

- technical issues (e.g. a range of VLEs and file formats are deployed)

- lack of understanding of open licensing amongst academic and technical staff

The Welsh Government should help HEIs to lower these barriers. Some specific actions which could do this might include:

- in relation to voluntary funding schemes managed by the Welsh Government, to impose a duty on the applicant to license all resources produced on these projects under an open licence

- to support HEIs seeking to move to an open licensing strategy

- to work with Jisc to support a programme of training and dissemination of open practice across HEIs in Wales. This programme should reach staff in a range of roles, including managerial, technical, and teaching

- to liaise with other sectors in Wales, especially schools, to support open practice[42]

- to study models of good practice from elsewhere in the world[43].

If digital resources are to be 'open', both producers and potential consumers and re-users need to be clear about what the term means. The simplest means of achieving this is for the producer holding the rights to the intellectual property in the work to indicate what actions are possible or restricted through specifying the type of licence that applies to it.

The educational community in Scotland is collaborating in a series of measures to promote 'openness' in the treatment of learning resources, and Higher Education Wales launched in September 2013 a 'Declaration of Intent'[44] to use OERs and Open Educational Practice (OEP) to improve higher education and the access to it. The Declaration includes encouragement for the use of 'open licences' to share learning and teaching material.

Open Scotland

Open Scotland[45] is an initiative involving senior representatives from a wide range of Scottish education institutions, organisations and agencies, which aims to leverage the power of "open" to develop the nation's education offering. Facilitated by Jisc Cetis, in collaboration with SQA, Jisc RSC Scotland and the ALT Scotland SIG, the group provides senior managers, policy makers and key thinkers with an opportunity to explore shared strategic priorities, and to scope collaborative activities to encourage the development of open education policies and practices. Stakeholders from neighbouring nations (e.g. Wales and Norway) are also involved in the discussions. The group proposes to develop a 'Scottish Open Learning' declaration and establish a working group to stimulate research in the area of open education and hopefully inform future Government policies and initiatives.

Creative Commons is now established across the world as the best recognised and most flexible licensing framework. It defines a small number of increasingly permissive licences from which producers may select the one most appropriate to their circumstances. The overwhelming majority of OERs worldwide are released using a Creative Commons licence, as this provides clear and unambiguous permissions for the reuse of material. We advise institutions to look to Jisc for advice and guidance in this area.

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42. Digital Classroom Teaching Task and Finish Working Group, *Find it, make it, use it, share it: learning in digital Wales*, 2012, p.21.
www.learn-ict.org.uk/resources/self_review/docs/findit-makeit-useit.pdf.
43. Mackintosh, Wayne (2012). 'Opening education in New Zealand: a snapshot of a rapidly evolving OER ecosystem', in J. Glennie, *Open educational resources and change in higher education: reflections from practice*, 2012, chapter 15, pp 263–281.
www.col.org/resources/publications/Pages/detail.aspx?PID=412
44. www.bbc.co.uk/news/uk-wales-24154504
45. http://blogs.cetis.ac.uk/lmc/tag/openscot/

The systematic use by HEIs of Creative Commons licences would reinforce a growing tendency in Wales to adopt them for the publication and re-use of electronic resources. The National Library of Wales agreed in 2013 a pioneering intellectual property rights policy of open access, as far as possible, to the material it has digitised from its own collections.[46]

Jorum is a comprehensive repository of OERs which have been shared by those who teach in or create content for the further education and higher education communities in the UK. Those educators in Welsh HEIs who create their own OERs should consider whether Jorum is an appropriate store for their material. One advantage of using Jorum in this way is that OERs will become more discoverable by would-be users, thanks to its own visibility and its provision of metadata to aid the retrieval of relevant material.

Recommendations

- The Welsh Government should encourage the systematic adoption of open licensing for open educational resources produced by HEIs in Wales

- Where possible staff and institutions should release open educational resources using an appropriate Creative Commons licence

- Institutions should make open educational resources widely available, including via the Jorum repository.

PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

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46. www.llgc.org.uk/index.php?id=6119

Background paper

Open and online resources: implications for practice in higher education institutions in Wales
Dr. Paul Richardson

1   Introduction

Background

Radical claims have been made regarding the significance of both Massive Open Online Courses (MOOCs) and Open Educational Resources (OERs) on the educational sectors in the UK. This paper looks at some of the implications of some of these developments for the HE sector in Wales, and discusses how the sector, and the Welsh Government, might respond.

The widespread and contentious discussion in the media has some disparate strands, which imply tensions between conflicting ideas. One of these is that MOOCs can imply, for some people, a 'democratisation of knowledge' (for example in the claims made by Daphne Koller for Coursera). At the same time, some authors claim that the cost of education can be driven down by the 'massification' of courses and the unbundling of tuition from assessment.

Definitions

OERs are variously defined, for example:

> "Open Educational Resources (OER) are teaching and learning materials that are freely available online for everyone to use, whether you are an instructor, student or self-learner. Examples of OER include: full courses, course modules, syllabi, lectures, homework assignments, quizzes, lab and classroom activities, pedagogical materials, games, simulations, and many more resources contained in digital media collections from around the world[47]."

> "Resources that are designed to be used and re-used in an educational context."[48]

> "Digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research"[49]
> (OECD, 2007).

[47.] www.oercommons.org

[48.] https://openeducational resources.pbworks.com

[49.] https://openeducationalresources.pbworks.com/w/page/24836860/What%20are%20Open%20Educational%20Resources

The discussions about this term often focus on the following questions:

- Open is generally taken to mean free of charge. Does it also mean free of registration, and other conditions?

- Do resources need to be designed for education, or simply used in an educational context?

- Can a resource be too small? Can any digital asset (e.g. a picture) qualify?

Massive Open Online Courses (MOOCs) are also hard to define. I quote a recent Universities UK report:

> "Massive open online courses are free, open access and scalable online higher education courses. MOOCs use a variety of online resources (such as videos and message boards) and seek to capitalise on high volume student classes by encouraging peer learning networks in place of more conventional synchronous learning and academic instruction. MOOCs may be developed independently by academics or they may be developed as part of contractual agreements between higher education institutions and third party online platforms. They enable students to access high quality academic content, and academics to engage with a much wider audience."[50]

Massive is a relative term, and a huge range of scales of course have been classified as MOOCs: from a few thousand up to hundreds of thousands of students. The use of the word 'scalable' gets around the problem of 'what is massive?', and the definition also encapsulates some of the possible contractual arrangements. However, it doesn't probe the meaning of 'open' or 'course', and fails to make a distinction between 'xMOOCs' and 'cMOOCs' (see below).

'Open' is also worth defining in this context. A simple definition of OER from *Into the wild*[51], a Jisc publication of 2012, states that these are "Freely available digital materials released under open licence, that can be used and re-purposed for teaching, learning, and research". However, 'open' with respect to courses typically means that anyone may enrol (although they may be required to pay). Hence the 'O' in 'OERs' is not necessarily the same as the 'O' in MOOCs. This issue is also evident in the critical comments made by Lorna Campbell concerning the FutureLearn terms and conditions[52].

50. www.universitiesuk.ac.uk/highereducation/Pages/MOOCsHigherEducationDigitalMoment.aspx
51. http://publications.cetis.ac.uk/2012/601
52. http://blogs.cetis.ac.uk/lmc/2013/06/05/what-do-futurelearns-terms-and-conditions-say-about-open-content/

A potentially elegant resolution to some of the tensions this creates is to be found in the concept of 'Open Educational Practices' proposed by Beetham et al. (2012)[53], and the implications of this are explored extensively in *Into the wild*. However, these ideas are still in the melting pot, and the notion of 'open' may be seen as continuous rather than absolute.

It is already clear that any government policy or initiative in this area will need to show a mature view of what 'open' means in its own context, and to elaborate the key implications of this view. An expansion of these implications may be found in the open licences and associated case studies published by Creative Commons[54]. The site also holds a registry of policies[55] (national and institutional) which may help policy makers to understand the overall landscape.

'Online' is perhaps the least contentious part of the acronym, but even here there is the potential for confusion. It may mean that the material is delivered online, but could be studied offline. Alternatively, it could imply that a continuous online connection is required in order to participate. This distinction may not be important to many users in the developed world, but digital exclusion is still an issue for some, even in the UK, and may be especially significant at a global level.

A few aspects of the word 'Course' are also worthy of discussion. Some questions which need to be addressed include: Does a course need to be validated? Is accreditation necessary? Should there be a definite start and end date? For example, OpenLearn 'courses' are validated, but not accredited, and have no start or end dates. Does this make them OERs rather than courses?

Much of the published material on MOOCs is essentially opinion. Where data is included, this is frequently methodologically unsound in origin, e.g. from biased or small samples, or from selected subsets of students. This paper has given precedence to quantitative material wherever this is available, but the predictive power of this information is sometimes limited.

A brief history of OERs and MOOCs

It has become a mantra of educational technologists that the internet has the power to transform the learning experience and with it the learning economy. However, promises of radical change have not always led to the revolutions which some people anticipated. With the development of Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs), we are once again being told by some to expect a revolution in the global education sectors; meanwhile other authorities see them as yet

53. Beetham, H., Falconer, I., McGill, L. and Littlejohn, A. *Open practices: briefing paper*. JISC, 2012 https://oersynth.pbworks.com/w/page/51668352/OpenPracticesBriefing
54. http://creativecommons.org/
55. http://wiki.creativecommons.org/OER_Policy_Registry

another false dawn or, worse, an unwelcome disruption to current practice. Many intermediate views are also possible. Governments, higher education institutions and other stakeholders will need to take an informed view of these developments, and to recognise the ways in which their business may be affected.

The change has been some time in coming. Projects and initiatives designed to promote resource sharing abounded in the early years of the World Wide Web, and a good many of these are summarised by Kernohan and Thomas (2012)[56]. In the UK this led to the birth of Jorum, which remains the most significant national repository for learning resources. In 2002 the Massachusetts Institute of Technology surprised many observers by making available many of its learning resources online, at no charge. At first sight, this may have seemed like 'selling the family silver', but an alternative view was that the resources themselves had no re-sale value, since the value of the course is in the learning experience, which includes interaction with tutors and peers. This view was lent credence by Diana Laurillard's thesis of learning as a conversation (Laurillard, 2002[57].

The Open University launched OpenLearn in 2006, exploring a similar notion. Courses are made available online at no charge, providing learners with the opportunity to study the resources, but without tutor support or accreditation opportunities. Interaction with other learners is made possible via forums, but in practice these are rarely used.

Meanwhile, the explosion in online learning resources continued, but it has become abundantly clear that there was a huge gap between exposure to these and a true educational experience. Moreover, there is scant evidence of engagement with OERs on a large scale, aside from those which could also be regarded as entertainment (for example OU/BBC collaborations, such as the 'Coast' series).

In 2008 the term MOOC was coined, initially to describe a course by George Siemens and Stephen Downes, 'Connectivism and Connective Knowledge'. It was later used by Sebastian Thrun (then at Stanford) and colleagues to describe their course 'Introduction to Artificial Intelligence', which attracted more than 160,000 participants (although the degree of commitment shown by these learners was very variable). A well informed account of the development of OERs and MOOCs may be found in Yuan and Powell (2013; see Figure 1)[58].

[56.] David Kernohan and Amber Thomas: 'Open Educational Resources – A Historical Perspective'. http://repository.jisc.ac.uk/4915/

[57.] Laurillard, D. (2002). *Rethinking university teaching: A framework for the effective use of learning technologies*. Routledge.

[58.] Li Yuan and Stephen Powell (2013): MOOCs and Open Education: Implications for Higher Education. http://publications.cetis.ac.uk/2013/667

Figure 1: MOOCs and Open Education Timeline (from Yuan and Powell, 2013)
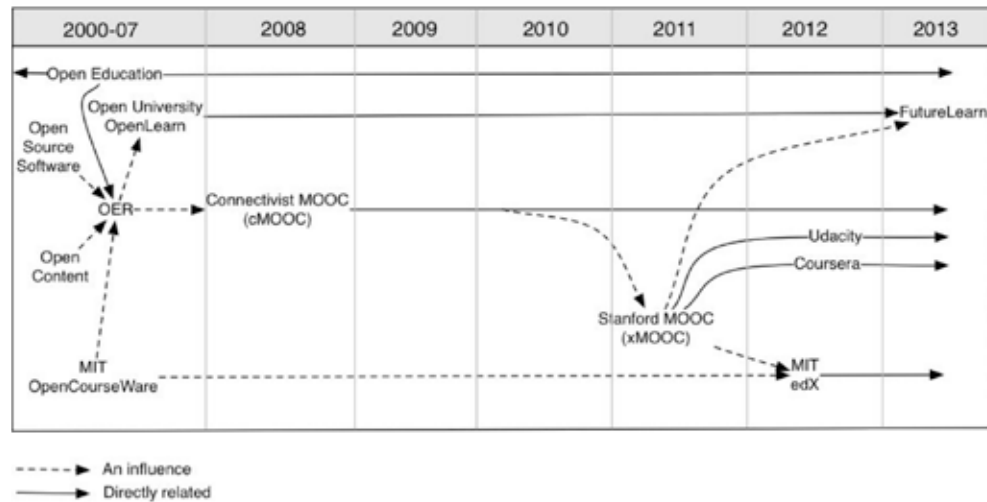
One question which emerges from Yuan and Powell's discussion is that of the MOOC as a 'disruptive technology', in the meaning of Bower and Christensen (1995)[59], i.e. an innovation which improves the product in a way which the market does not expect. The argument on this question is somewhat polarised: some observers such as Donald Clark see the MOOC as a hugely important development, while others, e.g. David Kernohan, refer to the excessive hype around the subject. Kernohan's argument is strengthened by Christensen's retreat from the 'disruption in education' argument upon which Sebastian Thrun and others rely so heavily. The key difference between these observers is their predictions of the trajectory of performance improvement; a steep increase is required here in order to validate the idea. 'Performance' in this case must relate to either quality or cost-effectiveness (or perhaps both), but both of these are inherently unpredictable, and there may be tensions (or trade-offs) between these aspects.

Meanwhile OERs have been maturing, and it could be argued that usage is more embedded in UK HEIs. A Jisc programme (summarised in *Into the wild*[60]) has addressed technical problems relating to production, curation and discoverability, and tested the user experience in a series of pilots. The programme also charted the enormous growth in open content and resources. If this continues at the present rate, we can expect some of the 'open practices' described here to become mainstream in the relatively near future. In the medium term, OERs may exert more influence than MOOCs.

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59. Bower, J., Christensen, C., (1995). Disruptive technologies: catching the wave. *Harvard Business Review*, pp.41–53.
https://cbred.uwf.edu/sahls/medicalinformatics/docfiles/Disruptive Technologies.pdf
60. http://publications.cetis.ac.uk/2012/601

MOOCs: typology and examples

A distinction is commonly made between the 'Connectivist' (cMOOC) model originating in Canada, where the term was first used, and the model based on a more didactic approach based on resource transmission (xMOOC). Further explanation of these categories may be found in David Kernohan's Jisc Inform article[61], and by Rodriguez (2012)[62]. The 'Big Three' xMOOC providers in the U.S. are Coursera, Udacity, and EdX. The key features of, and differences between, these platforms are summarised by the New York Times (2012)[63].

Some examples of MOOCs are listed in Table 1. However, it is worth stressing that some of these are not necessarily massive, some are not open (see McAndrew 2013)[64], and others, such as Khan Academy, are probably not courses. It is likely that there will be plenty of future initiatives which straddle the fuzzy line of 'MOOCdom'. The significance of these will hinge not just on whether or not we decide to call them 'MOOCs', but also on their overall position in the sectors which they serve (which could include industrial and voluntary sectors, as well as education). Some questions which may help to categorise MOOCs more precisely could include:

- Do learners work synchronously, or at their own pace?

- Is technical and/or tutorial support available?

- Are learners awarded a badge or certificate (on completion, or on passing an assessment)?

- Is there a charge for the course?

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[61]. Kernohan, D. (2013) Making Sense of MOOCs. JiscInform. www.jisc.ac.uk/inform/inform36/MakingSenseOfMOOCs.html#.UYuOIcqJSb4(Accessed 09/05/13)

[62]. www.eurodl.org/materials/contrib/2012/Rodriguez.pdf

[63]. The Big Three, at a Glance: www.nytimes.com/2012/11/04/education/edlife/the-big-three-mooc-providers.html?ref=edlife&_r=1&

[64]. MOOCs are NOT open (McAndrew): www.timeshighereducation.co.uk/news/us-mooc-platforms-openness-questioned/2002938.article

Table 1: Some examples of specific MOOCs; there are hundreds (perhaps thousands) of others

Course Name	Type	Provider	Refs
Khan Academy	OER/MOOC?	Khan Academy	www.khanacademy.org/
Connectivism and Connective Knowledge	cMOOC		http://cck11.mooc.ca/
Introduction to Artificial Intelligence	xMOOC	Stanford (now Udacity)	www.ai-class.com/
OldsMOOC	cMOOC	OU/Jisc	www.olds.ac.uk/
E-Learning and Digital Cultures	cMOOC	Uni Edinburgh	www.coursera.org/course/edc
ocTEL	cMOOC	Association of Learning Technology	http://octel.alt.ac.uk/
PHONAR, PICBOD	Hybrid	Coventry	http://phonar.covmedia.co.uk/ www.picbod.covmedia.co.uk/
DS106	Open course in Digital Storytelling	University of Mary Washington	http://ds106.us/

2. MOOCs – a new disruptive force in higher education?

There are some extreme positions taken on the 'MOOCs' question, for example, that they will change everything, or that they will change nothing. This section looks at the evidence for these positions, and a range of intermediate views.

Opportunities and threats

In theory MOOCs may represent an opportunity for HEIs to reduce costs, enhance recruitment or improve the quality of the student experience. Claims to reduce costs emerge primarily from the notion that the student-to-teacher ratio can be extended drastically. The viability of this is

contentious, especially in relation to assessment and quality. Enhancement of recruitment is probably a more secure rationale, and has long been asserted in relation to OERs (e.g. OpenLearn). The impact on quality is also uncertain, and poorly justified on current evidence. However, there is some evidence that the development of online teaching skills across the institution may have wider benefits.

MOOCs are also widely seen as a disruptive threat. This view is most strongly expressed in Barber et al., 2013[65]. The involvement of some key global players in the MOOCs market may be seen as evidence of this threat.

Who is signing up for MOOCs?

There is a paucity of information in the public domain on the subject of learners' demographic background. Some MOOC providers gather detailed information, but this is rarely published. Currently, the most credible data is from a study carried out at Edinburgh University of the participants in their Coursera courses[66]. They found that 70.3% of respondents had achieved degree level study (undergraduate 30.1% and postgraduate 40.2%). This is consistent with a larger data set gathered by Coursera, which showed that 43% of respondents held undergraduate degrees, and 37% held a Masters degree (or higher)[67]. However, the methodology is (quite understandably) not as robust as the authors might wish. Demographic data are not captured by Coursera, presumably in order to avoid discouraging new learners. Therefore these studies were carried out by separate surveys, with the concomitant risk of a biased sample.

Further data is available from Stanford University[68], in a paper which analyses student retention data in much more detail, by classifying student behaviour in relation to their aspirations and behaviour. In short, where students are just exploring the idea of MOOCs, or only aiming to view their content, it should come as no surprise that they fail to complete the course. However, much more research needs to be done here.

Learner engagement and outcomes

Learner engagement can be measured by recording visits to sites pages, or more tellingly by recording active engagement (submission of assignments, or posting of messages to forums). The Edinburgh report shows both metrics.

A total of 34,850 Statements of Accomplishment (SoAs) were awarded across the six courses, 21% of the total number of active learners on the

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65. http://www.ippr.org/publication/55/10432/an-avalanche-is-coming-higher-education-and-the-revolution-ahead
66. MOOCs @ Edinburgh 2013 Report #1 http://www.era.lib.ed.ac.uk/handle/1842/6683
67. www.dodsmonitoring.com/downloads/misc_files/MassiveOpenOnlineCourses.pdf
68. www.stanford.edu/~cpiech/bio/papers/deconstructingDisengagement.pdf

Edinburgh MOOCs. The boundary for achievements was set deliberately low, but required the submission of at least one assignment. While these statistics are clearly no match for conventional courses, or more formal online courses, they are high relative to the overall average for MOOCs, as found by Katy Jordan and reported by UUK[69], which indicates that the completion rate for most MOOCs lies between 5% and 15%. Katy Jordan's work on MOOC completion rates continues, and is regularly updated[70]. Broadly, the statistics appear to tell us that the larger the course, the greater the drop-out rate. However, conclusions may be confounded by confusion as to when a student genuinely becomes a learner (e.g. on registration, or attendance at first presentation).

Learning analytics

The management of quality in MOOCs will inevitably involve a big commitment to data analytics, including learning analytics. In this context, analytics may be defined as "the process of developing actionable insights through problem definition and the application of statistical models and analysis against existing and/or simulated future data"[71]. 'Learning analytics' is the application of analytics to gain insights to support educational aims and objectives[72].

Gathering data about the online activities of learners, and using it wisely, presents huge technical, organisational and ethical challenges. However, MOOCs may provide a huge incentive for the big HEIs to raise their stake in this business (see "Learning analytics at Stanford")[73]. A primer to this important area can be found in the CETIS Analytics series of papers[74].

Business models

Most MOOCs are free at the point of delivery to the learner. This raises some interesting questions for institutions which seek to recover costs of provision, and how this relates to their existing business interests (e.g. would MOOC provision by universities or other organisations undermine student recruitment?).

[69]. www.dodsmonitoring.com/downloads/misc_files/MassiveOpenOnlineCourses.pdf Page 16.
[70]. http://www.katyjordan.com/MOOCproject.html
[71]. http://publications.cetis.ac.uk/wp-content/uploads/2012/11/Analytics-Vol1-No1-Briefing-Paper-online.pdf
[72]. http://publications.cetis.ac.uk/wp-content/uploads/2012/12/Analytics-Brief-History-Vol-1-No9.pdf
[73]. http://news.stanford.edu/news/2013/april/online-learning-analytics-041113.html
[74]. http://publications.cetis.ac.uk/c/analytics

As Andrew McGettigan pointed out[75], efforts to monetise MOOCs come as politicians wrestle with public disinvestment from mass higher education in the UK and elsewhere. Globally, student fees have risen to compensate for a deliberate drop in state funding. McGettigan cites US commentator Christopher Newfield: "The distinctive feature of MOOC marketing in 2013 is the shift from being an intriguing experiment to being pushed as a workable solution to budgetary and access crises."

Some insights into these complex issues can be inferred from the existing business relationships for MOOCs in the U.S, and their funding sources. Coursera and Udacity are both funded by venture capital, to the tune of some $15 m each, while EdX receives funds of about $60 m from its parent institutions, Harvard and MIT. These funding streams and others are illustrated in more detail by the *Chronicle for Higher Education*[76].

The Chronicle's diagram gives a succinct overview of the MOOC business in the U.S. and shows current funding patterns, but also implies some interesting questions about longer-term funding, e.g. how will universities and venture capitalists retrieve their investments? Some similar arrangements exist in the UK, with sponsorship from various non-profits being crucial (e.g. the William and Flora Hewlett Foundation are sponsors of OpenLearn)[77]. Detailed discussions of some key trends in the funding of higher education in the UK (in comparison with the US) may be found in McGettigan's book The great university gamble (2013)[78].

The 'blogosphere' is currently rife with speculation about how universities will make money from MOOCs, and many of these ideas are subjective and untested. A list of eight possible strategies for 'monetizing' MOOCs can be found in a contract between University of Michigan and Coursera (obtained and published by the Chronicle of Higher Education under a Freedom of Information request in 2012)[79]. This list includes strategies which have been used traditionally in HE, as well as some others which have emerged from the world of internet business and start-ups. There is currently a debate as to whether or not these 'dotcom' models are appropriate in a HE context. To explore this a little, I have associated some examples with some of these strategies (Table 2). Further exploration of 'monetisation' issues may be found in a recent *Economist* article[80].

75. Andrew McGettigan (2013). Q. Will 'Moocs' be the scourge or saviour or higher education? www.guardian.co.uk/commentisfree/2013/may/12/moocs-scourge-saviour-higher-education
76. Chronicle of Higher Education (2013) Major Players in the MOOC Universe. http://chronicle.com/article/The-Major-Players-in-the-MOOC/138817/ (Accessed 09/05/13).
77. www3.open.ac.uk/media/fullstory.aspx?id=9671
78. McGettigan, A. (2013). *The Great University Gamble: Money, Markets and the Future of Higher Education*. Pluto Press.
79. http://chronicle.com/article/Document-Examine-the-U-of/133063/ (see page 40)
80. www.economist.com/news/business/21582001-army-new-online-courses-scaring-wits-out-traditional-universities-can-they

Table 2. Monetisation strategies for MOOCs, with examples

Strategy	Example(s)
Certification	"Fund 'pick-and-mix' Mooc generation, ex wonk advises" "Coursera Takes A Big Step Toward Monetization, Now Lets Students Earn "Verified Certificates" For A Fee" http://techcrunch.com/2013/01/08 coursera-takes-a-big-step-toward-monetizationnow-lets-students earn-verifiedcertificates-for-afee/
Secure assessments	"California Considers Credit for MOOCs". http://ehis.ebscohost.com.libezproxy.openac.uk/eds detail?sid=a98a1a3f-96a44a059e9ca28006eb6568%40 sessionmgr1&vi=1&hid=5&bdata=JnNpdGU9ZWRzLWxp Umc2NvcU9c2l0ZQ3d%3d#db=a9h&A=86207064
Employee or university	"Providers of Free MOOC's Now Charge Employers for Access to Student Data" http://chronicle.com/article/Providers-of-FreeMOOCs-Now/136117/
Human-provided tutoring or manual grading	Specific examples of this were hard to find. However, there is discussion of group work as a pedagogical alternative to individual MOOC engagement[81].
Corporate university enterprise model	"Coursera, Chegg and the Education Enclosure Movement." www.hackeducationcom/2013/05/08/courserachegg/
Sponsorships/ Venture Capital	www.learncapital.com/
Tuition fees	Many online providers (e.g. the Open University)
Advertising	http://alison.com/

These strategies indicate how the market may play out in the longer term. In terms of current practice, the business case for OERs appears to have been based on three premises. Firstly, as 'spin-offs' from normal activity they are relatively cheap to produce. Secondly, they support and expand student recruitment, by showcasing the best of what is on offer and allowing potential students to engage with resources at zero cost. Thirdly, there is also the argument that development of MOOCs (and OERs) challenges academics to enhance pedagogy, and therefore could potentially confer wider benefits on whole organisations.

Any positive impact on student recruitment is hard to measure, as is the more intangible effect on the reputation of the institution. Difficulties of evidencing these benefits may have deterred some institutions from engaging with OERs

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[81.] www.stanford.edu/~cpiech/bio/papers/deconstructingDisengagement.pdf

to date. However, MOOCs may offer an attractive alternative in this respect, allowing institutions to interact directly with groups of informal learners, who may potentially become formal (paying) learners at some point. An expansion of the argument about MOOC as a marketing tool, and plenty of other strongly held views, may be found in Donald Clarke's blog[82].

Universities which who have engaged in MOOCs have, without exception, taken steps to keep these activities separate from the core business of universities. Typically this separation has been achieved either by entering contracts with specialist providers (e.g. Coursera), or by setting up a spin-off enterprise specifically for MOOC delivery, as the Open University has done in the case of FutureLearn. Yuan and Powell (2013)[83] explore the rationale behind these decisions.

Shifting global practice?

Globally, growth in this area is remarkable. In the US, the number of students taking at least one online course increased over the last year by over 570,000 to a new total of 6.7 million. The proportion of all students taking at least one online course is at an all-time high of 32% (Allen and Seaman, 2013)[84]. However, these data relate to the entirety of online provision, and do not attempt to single out MOOCs[85]. Interestingly, the annual growth (9.3%) has eased somewhat in the last year, despite 2012–2013 being the year of greatest hype about MOOCs. It is perhaps too early to say whether or not this hype will be reflected in terms of students who start courses, and (more tellingly) those who complete them.

Predictions of radical change with respect to MOOCs are commonplace, and need to be considered in the light of existing contexts and practices. However, it is not easy to be objective about this, especially when some of the most cited analyses are written by key stakeholders in the business. An example is *An avalanche is coming*[86], written by senior staff at Pearson. Arguably, this document lacks objective analysis, and clearly reveals the company's interest in this area, as David Kernohan points out in his blog . Meanwhile, in the opposite camp to the big commercial players, there are plenty of commentators who rail against the intrusion of market forces in this area, but at the same time champion the concept of 'openness' which MOOCs can bring (e.g. see Bonnie Stewart's blog)[87]. Amongst all

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82. http://donaldclarkplanb.blogspot.co.uk/search?q=MOOCs:+Who%E2%80%99s+using+MOOCs?+

83. Li Yuan and Stephen Powell (2013): MOOCs and Open Education: Implications for Higher Education. http://publications.cetis.ac.uk/2013/667

84. www.onlinelearningsurvey.com/reports/changingcourse.pdf

85. 'An Avalanche is Coming'. http://www.ippr.org/images/media/files/publication/2013/04/avalanche-is-coming_Mar2013_10432.pdf

86. http://followersoftheapocalyp.se/were-under-fifteen-feet-of-pure-white-snow/

87. 'Participate or Perish?'. http://theory.cribchronicles.com/2013/05/12/participate-or-perish/

the uncertainties around the business and management of learning, there are also uncertainties regarding the future of technology itself. The trends to increasing use of mobile devices and improved connectivity are well established, and their continuation is sometimes taken for granted. However, this approach may not provide the most inclusive education for users who are excluded as a result of their lack of an internet connection, or perhaps due to their disabilities.

Institutions and governments seeking to anticipate the future have a difficult task, and the key factors which could act as a tipping point may be hard to spot. One aspect to watch closely is the link between the teaching and learning activities on the one hand, and accreditation on the other. Traditional universities are predicated on this close link, and quality and funding systems also reflect this. However, there are signs that these functions may be effectively unbundled. In a recent review for Educause[88] James Mazoue lists a number of U.S. universities which now accept MOOC-based credits, opening the path for new partnerships, and articulation and progression routes involving a full range of organisations based in public, private and voluntary sectors. However, it is worth bearing in mind that the unbundling of accreditation and learning is neither a new idea, nor confined to MOOCs. Accreditation of Prior Learning is already well developed in Wales (in the form of the Credit and Qualifications Framework for Wales[89]) and in Scotland[90], and there may be scope for applying these principles in MOOCs and other online courses.

On the other hand, if HEIs opt to keep assessment and teaching closely allied, then MOOCs may remain peripheral. Those who regard this as the most likely future scenario were provided with some powerful evidence earlier this year, when Coursera announced that they plan to explore "MOOC-based learning on campus"[91], essentially a slight variation on the "blended learning" concept which is already well established in practice. Martin Weller's critique[92] of this announcement ("You can stop worrying about MOOCs now") lends weight to the idea that MOOCs may fail to deliver the wholesale disruption to the system which some have predicted.

[88]. James Mazoue (2013): "The MOOC Model: Challenging Traditional Education". www.educause.edu/ero/article/mooc-model-challenging-traditional-education

[89]. http://wales.gov.uk/topics/educationandskills/qualificationsinwales/creditqualificationsframework/reports/?lang=en

[90]. http://www.elrah.ac.uk/

[91]. http://blog.coursera.org/post/51696469860/10-us-state-university-systems-and-public-institutions

[92]. http://nogoodreason.typepad.co.uk/no_good_reason/2013/05/you-can-stop-worrying-about-moocs-now.html

Current online practice in Wales

The Open University dominates the provision of online courses in the UK, offering around 600 courses at undergraduate and postgraduate levels. The remaining HEIs in Wales offer at least 104 courses in total (discounting 25 on 'Y Porth' which were only available to registered users). Some of these were complete programmes; many more were accredited units leading to qualifications, which were mostly postgraduate.

Subject material partially reflected the interests of the institutions and departments involved: e.g. humanities and theology at Trinity St David's, medicine and related disciplines at both Cardiff and the University of South Wales. The courses at Aberystwyth also clearly show the interest in libraries and informatics.

Cardiff University is clearly an important actor in this area, particularly in relation to postgraduate medical studies, and its membership of FutureLearn is a key development for Wales[93]. The University of South Wales also offers significant online provision, reflecting the interests of its constituent institutions prior to merger.

The Open University in Wales

Around 8,500 part-time students domiciled in Wales study with the OU, and it employs 325 Associate Lecturers. The OU in Wales has partners across a wide range of sectors (FE, HE, Trade Unions, and employers). Over 300 employers sponsor staff to study. In terms of financial and academic turnover, this makes the operation small relative to a number of other universities. However, it is distinctive in that the entire staff and student body is in some way engaged with online learning, which probably makes it the greatest single repository of experience and expertise in this area.

Partnerships

In his terms of reference the Minister asks specifically to what extent the Welsh higher education sector is working collectively to bring economies of scale to maximise the opportunities afforded by advances in learning technologies. A few examples are mentioned below.

Cardiff University has recently entered the FutureLearn partnership, which includes 23 (mostly UK) universities and several public sector organisations. FutureLearn is a private company owned by the Open University, which was created in 2012 specifically for the production and delivery of MOOCs. The first MOOCs were launched in September 2013.

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93. www3.open.ac.uk/media/fullstory.aspx?id=24794

Recent mergers in the Welsh HE sector have reduced the number of institutions to ten, and formed some alliances which have strengthened the ability of the organisations to 'do' e-learning. This is particularly true in South Wales, where the University of South Wales and the University of Wales, Trinity St David are both significant actors in this area.

Collaborative Welsh language provision is in the hands of the Coleg Cymraeg Cenedlaethol, which has a branch in each university. The online element is hosted at 'Y Porth'[94], which is a Blackboard 'Learn' platform. In May 2013 16 course were openly available, and a further 25 were open to registered users only. Staff at all HEIs in Wales are entitled to register, and the register currently stands at over 700 members.

A partnership (Advanced Training Project) between Aberystwyth and Bangor may point the way towards closer collaborations in an online learning context. This course teaches Sustainable Food Production, leading to an MSc.

An existing network, Reaching Wider, supports the widening access agenda. The Open University in Wales leads a project which promotes OpenLearn and other OERs[95].

3. Threats to HE institutions in Wales

Competitive threats

MOOCs are arriving on the scene at the same time as a range of other potentially disruptive forces are at work. These include cuts in funding from government, and an increasing role for the private sector in both provision and accreditation. All of this is taking place in a global context, with the result that taking an insular approach may be dangerous, or even impossible. Moreover, we are not choosing our own pace of change here; as Sheldon Rothblatt puts it, "The Future Isn't Waiting"[96].

The HEIs who are currently engaging in MOOCs are mostly doing so from a position of some economic and reputational strength. However, even these institutions are taking steps to insulate their core business from their MOOC provision. The Open University has set up a separate entity to run FutureLearn, and most of the Ivy League universities are contracting out their provision to Coursera, EdX or Udacity. This is an indicator that even (perhaps especially) these institutions see MOOCs as a threat, and that they see engagement with the business as a way of insuring themselves against the impact of future competitive threats. This in turn may imply that degree-awarding powers may not confer an impregnable advantage on universities, and that other organisations such as private sector companies may have the authority to assign value to learning.

94. www.porth.ac.uk/en/
95. www.open.ac.uk/blogs/OpenLearn_in_North_and_Mid_Wales/
96. Rothblatt, S (2012). The Future Isn't Waiting. In *The future university*, Routledge.

The situation for smaller HEIs is currently unclear. Some respondents to the survey clearly felt themselves to be very small contenders and unable to compete with the larger providers on anything like a level playing field. This is an interesting attitude, which is worth considering for a moment. There could be two aspects underlying this: size and reputation. It may be that smaller HEIs believe that only an institution of outstanding reputation is likely to succeed, or can afford to risk involvement in this area. Alternatively, the smaller HEIs may feel that they lack the capacity to deliver. However, the Edinburgh Coursera team estimate that around 30 days of academic (faculty) time is required for a 5–6 week MOOC, plus support and coordination time and direct costs (mainly video production and copyright clearance). This amounts to 180 hours of academic time, plus support, across the six courses, which does not sound like a massive investment, when spread across some 217,000 (non-paying) learners. Senior managers in HEIs may be unaware of these data.

The evidence here is therefore an incomplete mix of attitudinal and statistical. Respondents to our survey were not necessarily well informed. Indeed, there was evidence that middle managers had a much better understanding of the detail than did the senior managers. This means that both the threats and the competitive advantages may be greater than senior managers are ready to acknowledge.

Change management

Those universities which do engage and those which don't will need to tackle issues of change management which arise from shifts in the global education market. Stresses which emerge include the following: lack of funding[97], lack of infrastructure and staffing, unforeseen costs (most experienced staff say it costs more to teach online)[98], and quality issues (including a poorer learner experience)[99].

This may involve engaging with online provision, blended provision, or hybrid courses such as PICBOD and PHONAR at Coventry[100], where open online provision runs alongside the normal classroom experience. We probably have not yet seen the full range of combinations which is possible.

Development of open and online resources can improve teaching and the learner experience as they challenge academics and institutions to re-think pedagogic strategies and approaches, regardless of whether these are rethought in the context of online or face-to-face.

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[97] If Higher Education is a Right, and Distance Ed is the answer, who will pay?
www.distanceandaccesstoeducation.org/contents/JALN_v12n1_Meyer.pdf
[98] www.onlinelearningsurvey.com/reports/changingcourse.pdf
[99] www.irrodl.org/index.php/irrodl/article/view/1041
[100] www.wired.com/rawfile/2011/08/free-online-class-shakes-up-photo-education/

Quality and reputation of HE in Wales

It is noteworthy that much of the talk which lauds the possible benefits of MOOCs refers to the potential to enhance the quality of the learner experience[101]. However, the sceptical voices also clamour to be heard: these suggest that you cannot scale courses up to 'massive' numbers without losing quality in the student experience.

In the US, Allen and Seaman (2013)[102] found that around 40% of academic leaders believe that online degrees carry less credibility with employers. However, the UK context may be different, especially in view of the fact that many UK employers sponsor their staff to study with the OU. The spread of MOOCs, together with a range of formal and informal certification options, could lead to greater confusion in this area, and may prove a really disruptive influence on HEIs. This could make it hard for universities who offer degrees via this route to achieve widespread acceptance of these as 'real' qualifications.

At the same time there is plenty of anecdotal evidence in the media that the quality of the learner experience in MOOCs is no match for conventional courses: e.g. "Why online courses can never totally replace the campus experience"[103] and "A MOOC Backlash"[104].

This is a dissonance which needs to be resolved. The fear is that this will translate into a lack of faith in universities in general. This, combined with the impact of competition from the private sector, leads some commentators to talk of a coming 'tsunami', or an 'avalanche' which will hit the sector.

Managing quality, and the student experience

The standards for HEI with respect to the student experience (and much else) are set out in the UK Quality Code for Higher Education. Since 2012, the standards for online learning and e-learning have been incorporated into the 'Learning and Teaching' section of these standards, in recognition that good practice is essentially the same across all of these contexts.

The expectation for Student Engagement specifies that "Higher education providers take deliberate steps to engage all students, individually and collectively, as partners in the assurance and enhancement of their educational experience"[105]. The expectation for Learning and Teaching specifies "Higher education providers, working with their staff, students and

101. www.universitiesuk.ac.uk/highereducation/Pages/MOOCsHigherEducationDigitalMoment.aspx
102. www.onlinelearningsurvey.com/reports/changingcourse.pdf
103. Why online courses can never totally replace the campus experience: www.guardian.co.uk/education/2012/nov/19/open-online-courses-higher-education
104. www.huffingtonpost.com/jonathan-haber/a-mooc-backlash_b_3301739.html?ncid=edlinkusaolp00000003
105. www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/Quality-Code-Chapter-B5.pdf

other stakeholders, articulate and systematically review and enhance the provision of learning opportunities and teaching practices, so that every student is enabled to develop as an independent learner, study their chosen subject(s) in depth and enhance their capacity for analytical, critical and creative thinking."[106] In addition, the HE sector in Wales is increasingly buying in to the notion of students as partners, for example via the HEA 'Future Directions' programme[107].

The quality of MOOCs will inevitably be judged against this background of incremental improvement. *Prima facie* it is hard to avoid the conclusion that MOOCs as currently practised do not match these quality standards. At the same time, the decision to incorporate e-learning standards into the mainstream is based on sound principles. This raises the further question "Do MOOCs belong in the Higher Education system?" If MOOCs belong partly in the 'public' (or 'not for profit') higher education system, and partly in various commercial sectors (as the involvement of Coursera and Pearson might imply), then there are indeed some large tensions in the system, which HEIs will need to resolve. One approach to doing this is to identify what elements of MOOCs may be incorporated into current practice, with due respect to quality considerations. This could lead to the incorporation of MOOC-like elements in other courses ('blended learning').

Jaggars (2013)[108] has investigated the attitudes of students at 'Community Colleges' in the US who are studying both online and in classroom environments, to find out what motivates their choices. Students appreciated the flexibility of online delivery, but also reported that online courses had lower levels of instructor presence and that they thus needed to 'teach themselves' in these courses. Consequently, students typically preferred to take only 'easy' academic subjects online; choosing to take 'difficult' or 'important' subjects face-to-face. While this context is American, and at a slightly different level (more akin to F.E.), it may give some significant clues about how Welsh H.E. students may respond to online courses, and perhaps to MOOCs.

Aside from capturing additional business, universities clearly have a stake in supporting a satisfied and successful student body. This could perhaps be the area where there is most gap between the rhetoric and the reality. University leaders typically stress the significance of the quality of the student experience (e.g. Martin Bean[109]). However, Martin Hall (Vice Chancellor at Salford University) describes his own experience of a MOOC thus: "Apart from celebrating the sheer density and volume of all this online information,

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106. www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/Quality-Code-B3.pdf
107. www.heacademy.ac.uk/wales/future-directions
108. Jaggars (2013). Choosing Between Online and Face-to-Face Courses: Community College Student Voices. http://ccrc.tc.columbia.edu/publications/online-demand-student-voices.html
109. http://futurelearn.com/feature/interview-with-martin-bean-vice-chancellor-open-university/

I'm not clear how it added any learning value"[110]. Clearly, these are early days and this information is anecdotal. However, it may give an important indication as to what to look for in terms of the quality of the student experience. Lecturers may see things differently: for example Keith Devlin describes his experience of online teaching as a 'one-on-one', but he does not say how the students regarded this experience[111].

cMOOCs would be expected to offer a more complete student experience than xMOOCs, and there is certainly better (qualitative) evidence of a rich learner experience. Kop[112] writes about 'students as producers of knowledge', which indicates a much more complete learning experience than would be possible via an xMOOC.

The predominance of anecdotal information, or at best very crude statistics, is muddying the waters on quality to a significant extent. However, MOOCs clearly lend themselves to the gathering of much more sophisticated analytical data, and this is presumably already happening (although not published, for obvious reasons). However, openly shared data may become more prevalent once the market has settled somewhat. In this case, the value of a range of analytics approaches to learner management and quality control may become feasible.

A significant research initiative into the quality and effectiveness of MOOCs has recently been launched by the Bill and Melinda Gates Foundation and Athabasca University[113]. Encouragingly, the funders appear to take a broad view of what constitutes a relevant course, and considers "models of MOOCs beyond large centralized providers" and "models that blend online with in-person learning". Preliminary results from this project are expected to emerge by December 2013, and can be expected to inform policy and strategy in this area.

4. Opportunities for HE institutions in Wales

Widening participation

Widening participation is a priority for most, if not all HEIs in Wales. It commonly appears in some form in mission statements, and success in this area attracts funding. This priority is also reflected in Leighton Andrews' written statement providing the terms of reference for this Working Group. Globally, there is a huge interest in the potential for OERs and MOOCs to further this agenda. However, there is also scepticism in some circles, for example Christina Costa makes the point that their use as a marketing tool undermines the philanthropic purpose of 'openness'[114].

110. Martin Hall: www.corporate.salford.ac.uk/leadership-management/martin-hall/blog/2013/05/more-on-moocs/

111. "Teaching on a MOOC is a One on One" http://www.youtube.com/watch?v=vpF5e9J05oQ

112. Students as 'producers' of knowledge (Kop)

113. www.moocresearch.com/

114. http://knowmansland.com/blog/2013/05/26/digital-champions-moocs/

The drivers for a more open, flexible and student-centred HE infrastructure are global, and have been well described and widely discussed , e.g. in the special edition of the journal 'Distance Education' in 2012[115]. Meanwhile, Comrie (2011)[116] outlines these drivers in the Scottish context, and they include a need to support part-time students who may already be in work, as well as those from a wider range of age groups and social demographics.

OER and 'widening participation' have been regularly juxtaposed in the literature over several years now, but the evidence for impact is patchy. For example, Chen et al. (2010) show a positive impact of web-based technologies on student engagement and recruitment[117]. However, the best quantitative information comes from the US, in the form of a metastudy of data from three universities: MIT, John Hopkins and the Open University of the Netherlands. The data were partly mined from the website pop-ups, and partly -more compellingly – emerge from undergraduate questionnaires. The authors conclude that open course materials "can be an important tool to increase or widen participation in formal higher education, especially in supporting a return to formal education by lifelong learners"[118].

In Wales, some indications are provided by the outcomes of a project in 2012, which brought OpenLearn to a wider audience, targeting Communities First areas[119]. Amongst many other findings, the team found that OER are generally best presented as part of a clear progression route (OpenLearn carries implicit assumptions about reasonably high ICT skills, for example). This may work best in a group context, although the variation in skills levels shown in these groups was very marked. This implies that there may be potential for organisations to 'cherry pick' suitable resources to incorporate into their own curriculum. However, it probably does not encourage the view that MOOCs on their own will be of clear benefit, at least in their current form. There has been little evidence of the success of inexperienced learners with cMOOCs, and the reasons for this are explored in a paper by Hendricks[120]. However, hybrid models of MOOC delivery,

115. Conole (2012). Fostering social inclusion through open educational resources. Distance Education 33 (2), 131–134. http://onlinelibrary.wiley.com/doi/10.1111/ejed.12019/full
116. Comrie (2011). Future Models of Higher Education in Scotland. *Campus-Wide Information Systems* 28 (4), 250-257 www.emeraldinsight.com/journals.htm?articleid=1949220
117. Chen, Lambert and Guidry (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. Computers and Education 54 (4), 1222–1232. www.sciencedirect.com.libezproxy.open.ac.uk/science/article/pii/S0360131509003285
118. Stephen Carson et. al. 'Impact of OpenCourseWare Publication on Higher Education Participation and Student Recruitment'. www.irrodl.org/index.php/irrodl/article/view/1238/2336
119. Hudson, Hughes and Rose-Adams (2012). Using Open Educational Resources to widen educational participation incommunity settingsLearning from the Reaching Wider in North and Mid Wales Project. www.open.ac.uk/about/inclusion-and-curriculum/projects/research-projects/widening-participation-through-open-educational-resources
120. http://blogs.ubc.ca/chendricks/2013/06/16/evaluating-cmoocs-using-downes/

such as Phonar and DS106, have seen significant success. For example, Bryan Jackson's work with a gifted and talented school pupils learning guitar has a "hybrid" online component[121].

The notion that most learners may needed to be guided through MOOCs (or any OERs) appeals to common sense, and has some powerful proponents in Sir John Daniel[122], as well as some of the key players in cMOOCs (e.g. Tony Bates, Stephen Downes). The online experience can be personalised, but not automatically. As Bates points out, computers don't personalise learning: "[Computers] allow students alternative routes through material and they allow automated feedback but they do not provide a sense of being treated as an individual. This can be done in online learning, but it needs online intervention and presence in the form of discussion, encouragement, and an understanding of an individual student's needs" (Bates, 2012)[123].

There is currently little published information about the value of MOOCs and OERs to disabled students, who are important stakeholders in the 'widening participation' agenda. Andy Lane investigates some of the issues of technology and disabled students in a 2009 paper 'The impact of openness on bridging educational digital divides'[124].

Overseas students

Recruitment of overseas students is potentially a 'big win' for MOOCs. Overseas tuition fees currently account for £2.94 billion of income (just over 10%) in UK higher education (McGettigan, 2013)[125]. The early indications from existing MOOCs also show promise in this area, as the recent UUK report sets out[126]. For example, after US enrolments, the largest number of enrolments for the Artificial Intelligence Planning MOOC run by the University of Edinburgh in early 2013 came from India (followed by Brazil, Spain, the UK and Russia).

Understandably, HEIs show some enthusiasm for increasing this, but there is a huge catch - namely visas. Moreover, the sector is dependent on a range of outside events influencing the intake of overseas students, which can cause rapid fluctuations[127] [128]. The complexities of UK law on this matter are well beyond the scope of this paper, but it can readily be appreciated that

[121.] http://talonsrockband.wordpress.com/
[122.] www.academicpartnerships.com/docs/default-document-library/moocs.pdf?sfvrsn=0
[123.] Bates, T. (2012). What's right and what's wrong about Coursera-style MOOCs? www.tonybates.ca/2012/08/05/whats-right-and-whats-wrong-about-coursera-style-moocs/
[124.] www.irrodl.org/index.php/irrodl/article/view/637/1396
[125.] McGettigan, Andrew (2013). *The great university gamble: money, markets and the future of higher education.* Pluto Press.
[126.] www.dodsmonitoring.com/downloads/misc_files/MassiveOpenOnlineCourses.pdf
[127.] Hannah Richardson, BBC News (May 2013) Sharp decline in foreign student numbers. www.bbc.co.uk/news/education-22642067
[128.] www.universitiesuk.ac.uk/highereducation/Pages/CommonsDebateInternationalStudents.aspx

HEIs may look for alternative routes of provision for overseas students, not involving migration. Many have opted for remote campuses, and HESA data for 2010–2011 show that this is a larger slice of the business than resident overseas students represent, at least in terms of student numbers[129]. However, management of these campuses presents some serious challenges.

Clearly, MOOCs represent an attractive alternative, if they can be monetised, and effectively managed. The Open University has lengthy experience of overseas business, and FutureLearn is already showing a major interest in exploring the Indian[130] and Australian markets[131].

Cost reduction (economies of scale)

The 'cost disease' in higher education is a shorthand way of describing how costs of provision have escalated in recent years. Essentially, this trend is a result of ongoing price and pay inflation, in an industry where economies of scale are hard to achieve. This is well summarised by Bowen (2012)[132] and by McGettigan (2013)[133].

There is some debate about whether or not MOOCs represent a serious strategy for cost reduction. On the face of it, and given the student-teacher ratios involved, they could be expected to yield huge cost savings. However, the only study which has looked collectively at lecturers who have taught on MOOCs indicates that this group is divided on the question of whether or not MOOCs can reduce costs[134]. Nevertheless, it is likely that HEIs will look at the ratios with interest, and look at whether or not there are savings to be made in academic salaries. They may also start to look at whether or not they could employ staff at lower grades to act as 'guides on the side' to support the 'sage on the stage'. Arguably, this approach has been taken by the Open University over its entire lifetime.

However, cost reduction strategies can be easily undone by the presence of hidden costs, which by definition remain unaccounted. A commercial partner (e.g. Coursera) may be well placed to take on the costs of administrative process, and infrastructure. However, the costs of course creation and support are often overlooked. Daniel (2012)[135], for example, describes how provosts at two universities reported that Coursera were not providing any

129. John Morgan (2011). THES. http://www.timeshighereducation.co.uk/414902.article

130. "Trade Mission to India"; http://www3.open.ac.uk/media/fullstory.aspx?id=25155&filter=general

131. www.enternships.com/internship/marketing-intern-focussed-on-the-australia-territory/futurelearn/51e6ad55970ffad165000005

132. http://edf.stanford.edu/sites/default/files/Bowen%20lectures%20SU%20102.pdf

133. McGettigan, Andrew (2013). The great university gamble: money, markets and the future of higher education. Pluto Press.

134. 'Profs divided on whether MOOCs can reduce costs. http://chronicle.com/article/The-Professors-Behind-the-MOOC/137905/#id=overview

135. www.academicpartnerships.com/docs/default-document-library/moocs.pdf?sfvrsn=0

pedagogical help for faculty in the preparation of courses. This suggests that Coursera are failing to account for the necessary capacity-building work in online pedagogies in their business plans. These concerns were echoed in some of the responses of the HEIs, both in the initial responses and the follow-up conversations.

Opportunities for partnership

The very high ratios between students and lecturers which are potentially achievable with MOOCs lead inevitably to a discussion of the possibility of partnership. Organisations which can specialise, and which are capable of providing online courses, can perhaps 'corner' the market in specific academic areas. Larger organisations may well be at a competitive advantage here (a glance at the names of the institutions signed up to Coursera, edX and Futurelearn will support this idea). As expected, the evidence also indicates a clear relationship between the size of an organisation and the likelihood that it will be planning a MOOC[136]. This could reflect the greater capacity of large institutions to 'do' e-learning, and their greater resilience supporting their ability to take risks, and absorb possible failures. However, recent research by the Babson Survey Research Group (Allen and Seaman, 2013)[137] indicates that large organisations which are already providing significant numbers of online courses are less likely to be considering MOOCs than those who have not yet entered the online business[138]. This is surprising, given the widely held view that online teaching capacity needs to be built. Clearly, some infrastructure is needed, as well as skills across a range of staff: teaching, support and technical. However, these findings suggest two major implications for Welsh HE: firstly that recent mergers in Welsh FE may provide a supportive climate for MOOCs; secondly that smaller organisations improve their chances of competing by entering into partnerships.

The kind of 'deep' partnerships described in Section 2 are not the only way forward. A host of other arrangements, such as guest lecturing are potentially supported by technology. Though the work of the Welsh Video Network has been innovative in this respect in the past, arguably this infrastructure is not as necessary as it was before, since it is now possible to carry out this level of collaboration with cheaper, more accessible technologies, such as Skype or Blackboard Collaborate.

Strengthening partnerships between HE institutions is only part of the picture; cross-sectoral partnerships involving HE, FE, industry and the voluntary sector

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[136]. Larger organisationss more likely to be planning MOOCS
www.onlinelearningsurvey.com/reports/changingcourse.pdf
[137]. www.onlinelearningsurvey.com/reports/changingcourse.pdf
[138]. Organisations with experience of online are LESS likely to do MOOCs!
www.onlinelearningsurvey.com/reports/changingcourse.pdf

are likely to become more significant, given current funding constraints.

This would indicate that the use of a wider range of technologies may be appropriate, although capacity to use these effectively is sometimes in doubt.

An interesting feature of the partnerships which have been built around MOOCs in the US is that a wide range of sectors is involved. This could be an encouraging sign for the way the business might develop in the UK, especially in the light of the failure of the UKeU, which is believed to have foundered primarily because of its isolation from key partners in sectors outside the higher education world[139].

Wider organisational benefits

The adoption of open practices across organisations can confer benefits which may help to balance the costs imposed by the need to develop capacity to deliver MOOCs, or to create OERs. In other words, it may help an organisation to build capacity to 'do' e-learning. For example, Andy Lane (2012)[140] reports on how the Open University has revisited its own perspective of what openness means to it as an organisation, and reveals some of the tangible benefits which have emerged from this process. For example, he shows how an understanding of the pedagogy of multimedia resources has been disseminated, along with a working knowledge of the discovery and use of OERs generally. However, most university staff will be less well prepared than those at the Open University: a recent UK survey of academics[141] indicates that only a small minority are using relatively simple technologies (e.g. digital media) in the lecture room. It would therefore be foolish to anticipate a high state of preparedness to teach any kind of course online, never mind a MOOC.

While the Open University may be atypical in its use of resources, it is hard to see many mainstream universities failing to benefit from a similar approach. There is evidence of this happening in some places, for example where the establishment on viable policies to support OER creation and use has led to wider adoption of open practices in two Scottish universities[142]. This type of reuse of existing resources within an organisation can help to sustain the skills and resources which are needed in the wider context.

139. "Select Committee Attacks the UKeU Fiasco". Education Journal 84, p 32: http://ehis.ebscohost.com.libezproxy.open.ac.uk/eds/pdfviewer/pdfviewer?sid=eb60886c-8ab5-4c58-a958-78dae00f7f11%40sessionmgr114&vid=1&hid=106

140. Lane, Andrew (2012). Case Studies on Institutional Open Approaches: The Open University. JISC: www.jisc.ac.uk/whatwedo/topics/opentechnologies/openeducation/open-university-summary.aspx

141. Housewright, R, Schonefeld, R.C. & Wulfson, K. Ithaka (2013). S+R/Jisc/RLUK UK Survey of Acadmics. Pp 54 ff. http://repository.jisc.ac.uk/5209/1/UK_Survey_of_Academics_2012_FINAL.pdf

142. Small steps in the right direction: MOOCs and OERs: http://blogs.cetis.ac.uk/lmc/2013/05/09/small-steps-in-the-right-direction/

5. Implications of shifting practice at HE Institutions in Wales

This section aims to review processes in which a student engages, from recruitment to graduation, and to identify the key adjustments which need to be made on the part of the learner and the institution. This could be subject of a significant paper in its own right, so I have limited this to some key issues.

Student recruitment

Most institutions who engage with OERs and MOOCs believe that they can use this strategy to boost student recruitment, and there is some supporting evidence for this, at least in the case of OERs[143]. However, targeting of demographic or geographic groups may be drastically skewed by this strategy, and universities will clearly need to address this in their strategic planning. Donald Clark sets out some of the key considerations in this planning, but he only scratches the surface of a very complex area[144].

Infrastructure and learning platforms

Current usage of learning platforms in FE and HE is based on a 'blended learning' model, i.e. students receive face to face support. A switch to MOOCs, with its entirely online model, will raise new questions for universities. They will most likely commission these services from elsewhere. However, an awareness of these issues is necessary in relation to procurement criteria, and it may be that 'hybrid' or 'miniMOOC' provision may be possible with in-house resources.

Other services which are relevant here include registration and learner information, library services, and learner support.

Teaching and learning methods, course design and resource creation

There is little doubt that leading a presentation of a MOOC involves a wider and different set of skills than would normally be used in the classroom, or even in smaller online contexts. One important skill is the management of student online forums; related skills include an understanding of licences and OER; technical capabilities with multimedia; peer learning processes[145]; and accessibility (especially in relation to sensory impairments).

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143. www.irrodl.org/index.php/irrodl/article/view/1238
144. Who's using MOOCs; 10 different target audiences.
   http://donaldclarkplanb.blogspot.co.uk/2013/04/moocs-whos-using-moocs-10-different.html
145. www.irrodl.org/index.php/irrodl/article/view/1041

Experience of teaching online is currently not widespread in Welsh universities. The main repository of expertise at HE level is at the Open University, and partnership between this and other HEIs could raise the capacity and capabilities of staff across the board.

Assessment

This is a key point, around which much else revolves. As with teaching and learning, the problem is essentially about scale - how can a lecturer assess many thousands of students? While a range of approaches is theoretically possible, in practice only two options have been widely adopted: automated testing systems, and peer assessment[146]. In her TED talk about the benefits of Coursera's MOOCs in the developing world[147] Daphne Koller claims that peer assessment is a key element in scaling , but there are few published examples where this has been successfully implemented. The most likely alternative approach, namely automatic essay marking, is not yet ready for market, and may be some years into the future[148].

This limited choice raises some important questions: are xMOOCs best (or only) suited to subjects which can be tested automatically (e.g. mathematics, computing, some science courses)? How can peer assessment be used fairly and objectively for summative assessment (or is it best used only formatively, informally)?

A related issue is that of online learner authentication. In 'traditional' online systems, this is done by a combination of one-off credential inspection (on registration) coupled with informal (tutor) proctoring. Technologies which could support authentication in MOOCs include webcams, and keystroke pattern recognition. The latter has been presented by some authors as a new technology, but this is not the case: see Monrose and Rubin (2000)[149].

Recently, an alternative strategy on assessment has emerged. This is predicated on the idea that 'proper' assessment could be carried out by teams of staff, providing that that learner numbers stay within reasonable limits. This is being tested at Edge Hill, on a course which is thought to be the first accredited MOOC offered by a UK university[150]. However, these authors concede that it is too early to say whether or not it will work – in the event of high recruitment rates, they may need to rethink their strategy.

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[146]. A range of assessments is possible, but most literature focuses on peer or MCQs and short answer quizzes Steve Cooper and Mehran Sahami (2013). Reflections on Stanford's MOOCs. Communications of the ACM 56 (2), 28.
http://dl.acm.org/citation.cfm?doid=2408776.2408787
[147]. www.ted.com/talks/daphne_koller_what_we_re_learning_from_online_education.html
[148]. www.guardian.co.uk/education/mortarboard/2013/may/24/automated-marking-bad-for-essays
[149]. www1.cs.columbia.edu/~hgs/teaching/security/hw/keystroke.pdf
[150]. www.timeshighereducation.co.uk/news/spooky-mooc-will-offer-degree-credits/2003651.article

Certification and awards

Most MOOCs currently issue some recognition of learner achievement. Typically, this would be a certificate of completion. Other informal recognition might include Mozilla Open Badges[151], a system in which the FutureLearn management is showing interest. This interest was also evident in the discussions with the wider community in Wales (including FE).

http://campustechnology.com/articles/2013/03/14/california-bill-could-allow-students-to-take-moocs-for-credit.aspx

154. Coursera: Students who take a course on its platform will now be able to earn "Verified Certificates" for a small fee: http://techcrunch.com/2013/01/08/coursera-takes-a-big-step-toward-monetization-now-lets-students-earn-verified-certificates-for-a-fee/

155. http://wikieducator.org/OER_university

6. Conclusions

This is what we understand about trends in the wider educational landscape:

- MOOCs are currently ill-defined. Distinctions between MOOCs and other online learning opportunities are increasingly blurred. OERs are better defined, and perhaps better understood.

- There is no clear business model for genuinely massive MOOCs. Monetisation of MOOCs may involve an unbundling of the teaching and accreditation processes, combined with a range of automated and human (tutor or peer) assessment. This is likely to involve both HEIs and the commercial sectors. However, in the absence of a clear business model, discussion of costs and benefits is largely hypothetical.

- MOOCs may be best suited to specific learner groups, or subject areas. They may feature as part of blended learning programmes. The original cMOOC model still has validity, since it supports active and discursive learning. Current user profiles do not encourage the belief in their potential on their own to widen participation in HE, but this could change.

- Taking these uncertainties into account, we do not expect that MOOCs (as we currently understand the term) will overturn core university business. However, MOOCs may introduce disruptions, e.g. leading to fewer three- and four- year degrees programmes. They may be particularly influential in vocational Masters programmes, WBL and informal learning.

- OERs are probably a more durable component of the educational landscape than are MOOCs and may be a more significant influence in the medium term. Structures which support 'open practice' are starting to emerge, in the UK and elsewhere (although the values underlying open practices are not always fully understood). Some governments are starting to respond to these changes, e.g. by implementing policies relating to open practice.

The implications this has for education in Wales are:

- Experience of providing online learning is growing, across all educational sectors; this is likely to enhance the capacity of organisations to adopt some of the practices associated with MOOCs. Experience of and enthusiasm for online learning in wider sectors (FE/WBL/ACL) also indicates the scope for cross-sectoral collaboration. However, current levels of experience in individual organisations are unlikely to equip them to become significant players in the market.

- Partnership between organisations is likely to prove a key factor in further developments.

- Government policy with respect to funding, support and inspection of online learning will need to take account of these developments.

- We do not believe there is a case for supporting a generic all-Wales MOOC. However, Future Learn will provide us with a model case, indicating how HEIs in Wales (and elsewhere) might be expected to respond.

Appendices

Appendix 1

Online Digital Learning Working Group

Written Statement by Leighton Andrews, Minister for Education and Skills, 28 February 2013

I announced to the Higher Education Leadership Foundation in December last year that I intended to establish a Working Group to examine the potential for online digital learning and how the Welsh Government can support the higher education sector in this growing field.

I am delighted that Andrew Green, National Librarian of Wales, has agreed to chair the Working Group.

Welsh Universities are already engaged in a range of activities designed to maximise the benefits afforded by advances in learning technologies. In seeking to respond to the cultural shift in the expectations of students, universities are eager to engage through the latest online teaching methods. Globally, the advent of MOOCs (Massive Open Online Courses) represents a new internet-based model for volume participation in higher education.

Such ventures are not new - the Open University has been offering open source material for some time. More recently, however, a series of MOOC ventures has been launched by some of the most prestigious global academic institutions such as Stanford, MiT and Harvard. Udacity and Coursera (which includes the University of Edinburgh) are among the pioneers for a new brand of for-profit online higher education providers. In just one year these new ventures have attracted over $100m of private venture capital investment. Whilst the long-term sustainability of such ventures may be open to question, the reach and quality of such disruptive innovations may have profound implications for the delivery of higher education in Wales. At the end of 2012 the Open University announced the launch of Futurelearn, with partners including Cardiff University, to produce a UK-based platform for massive open online courses.

Our aim is to ensure that Wales is well placed to continue to prosper in the face of such developments. The Working Group will be tasked with examining the potential for MOOCs and whether the Welsh higher education sector is sufficiently prepared to meet these challenges. I intend that its remit should go wider, however, to consider also the opportunities and challenges presented by the development of open educational resources more broadly.

The terms of reference for the Working Group will be to advise the Welsh Government on:

- the potential competitive threat posed by global technology-based developments to the higher education sector in Wales;

- the potential opportunities afforded by technological development for the Welsh higher education sector at a time of constrained public expenditure;

- to what extent the Welsh higher education sector is working collectively to bring economies of scale to maximise the opportunities afforded; and

- to what extent technological development may provide a platform to increase participation in part-time and full-time higher education, again in a period of constrained public spending.

The Working Group will begin its work in March. I have asked Andrew Green to report to me by the end of September this year.

Appendix 2

Online Digital Resources Group

Membership

Andrew Green (Chair)

Andrew Green was the Librarian of the National Library of Wales between October 1998 and March 2013. His previous career was spent in universities in Wales and England, and for many years he served on the Council of Aberystwyth University. In 2011-12 he was a member of the Digital Classroom Teaching Task and Finish Group that recommended the establishment of 'Hwb', the all-Wales learning platform for schools and colleges.

Dr Bela Arora
Manager, Graduate School, University of South Wales

Dr Bela Arora is an academic and manager in higher education with experience of lecturing, research and policy development in some of the UK's top higher education institutions. She was responsible for developing one of the UK's first online Postgraduate Certificates in Developing Professional Practice in Higher Education. Bela currently oversees the postgraduate research experience at the Graduate School and is the Chair of the Pedagogic Research Group on Learning Spaces.

Jo Caulfield
University of Bangor; former President of Bangor University Students' Union

Jo Caulfield works in student engagement and teaching and learning enhancement at Bangor University. She oversees a range of institutional initiatives to further develop the university's learning experience through collaboration with students. Her previous role was as President of Bangor Students' Union and member of NUS Wales' National Executive Committee.

Rob Humphreys
Director of the Open University in Wales

Rob Humphreys is the Director of the Open University in Wales, having held posts previously at Swansea University and as Director for Wales of the National Institute for Adult Continuing Education. He was appointed by the Minister of Education to the first and second 'Rees Reviews' of higher education funding of universities in Wales. Rob was later appointed to the Independent Review of Higher Education in Wales and chaired the independent review of governance in Further Education. He is currently a member of the Silk Commission on Devolution.

David Jones
Principal and Chief Executive of Coleg Cambria

David has over twenty six years experience in the FE and HE sector in Wales. He has led three successful mergers of FE colleges since 2009, bringing together Deeside College, Llysfasi College, the Welsh College of Horticulture and finally Yale College to form Coleg Cambria in August 2013. He is currently the Chair of the Deeside Enterprise Zone, a board member of the Qualifications Wales Advisory Board and of the CBI Wales Council, and was until May 2013, the Chair of Colleges Wales – Colegau Cymru, for which he continues to be a Board member.

Professor Dylan Jones-Evans
University of Wales

Until 2013 Professor Dylan Jones-Evans was Director of Enterprise and Strategy at the University of Wales and visiting professor of entrepreneurship at Turku University in Finland. He is now Professor of Entrepreneurship and Strategy at the University of the West of England. He is the founder of the Wales Fast Growth Fifty – the annual barometer of entrepreneurship within Welsh business – and is currently leading a major review of business finance for the Welsh Government.

David Kernohan
Programme Manager, eLearning, Jisc

David Kernohan works on online and open education within Jisc's eLearning Innovation team. He has managed a range of major initiatives in this area, most notably the Open Education Resources programme and emerging work around Massive Open Online Courses (MOOCs). He also has an expertise in English Higher Education policy and global HE trends, having previously worked for HEFCE as a policy analyst. David took over from Sarah Porter as a member of the Working Group in July 2013.

Sarah Porter
Head of Innovation, Jisc (formally known as Joint Information Systems Committee)

Until 2013 Sarah Porter was Head of Innovation at Jisc. In that role, she planned and led Jisc's innovation strategy which supports the post-compulsory education sector to embrace the potential of IT to enhance learning, teaching, research and institutional efficiency. Sarah led the Jisc's innovation agenda for eight years, after having directed Jisc's e-learning programmes for four years. Prior to joining Jisc, Sarah worked in universities, in local and national roles. On leaving Jisc Sarah was replaced on the Working Group in July 2013 by David Kernohan.

Professor Patricia Price
Cardiff University

Professor Patricia Price is Pro Vice-Chancellor, Student Experience and Academic Standards. She is responsible for the University's programmes of study, its academic standards and the quality of the student experience. Her specific responsibilities include oversight of the development of the University's education strategy, its implementation and monitoring; the quality of the student experience at Cardiff; oversight of the University Graduate College and the University's widening access activities.

Dr Dafydd Trystan
Registrar of Coleg Cymraeg Cenedlaethol

Dr Dafydd Trystan is Registrar of the Coleg Cymraeg Cenedlaethol. He has led online learning projects in the Social Sciences on behalf of the Higher Education Academy and is actively involved with the development of Y Porth, the Coleg Cymraeg's e-learning portal which hosts Welsh-medium university modules and open-access material to enhance learning through technology. Dr Trystan also chairs a Cycle Training Social Enterprise, Cycle Training Wales; and is a board member of TooGoodToWaste and Sustrans Cymru.

Appendix 3

Summary of consultation results

Approach

The Online Digital Learning Working Group invited the views of a wide range of stakeholders in online and digital learning in Wales. The strategies have been as follows:

• Written consultation

• Informal discussions with HEIs, following the consultation

• Discussions with other organisations (Colegau Cymru and Higher Education Wales).

The views of stakeholders have been reported to the meetings of the Working Group, and taken into account in the drafting of the final report. This document outlines what has been learned from these consultations.

Outcomes

The consultation questionnaire was released on 1 May 2013, in separate Welsh and English versions, and publicised through a range of channels, including Jisc RSC Wales and the Dysg Newsletter. Although the formal consultation period ended on 31 May, a few submissions were accepted after that date.

We received 17 responses to the survey, as follows:

• 8 from Higher Education Institutions (HEIs)

• 3 from Further Education Institution (FEIs)

• 3 from Work Based Learning providers (WBLs)

• 2 from Adult Community Learning providers (ACLs)

• One personal response

The responses came from a range of roles and levels within organisations. The outcomes of the entire process are summarised below.

Question 1
Do you currently provide online learning courses beyond the walls of your institution, either independently or in partnership with other organisations? (Please include summaries or references where appropriate.)

HEI respondents to this question were sometimes unaware of courses offered by their own institutions. This could be due to differing interpretations of

what is meant by 'online', or perhaps of the word 'course'. However, some further desk research was carried out in order to estimate the scale of online provision in Wales, and the outcomes of this are discussed in the main report.

Providers from other sectors were keen to report to their own work in online provision, and e-learning more generally. There is a range of distance and online provision, including Learndirect, which is still a significant part of the landscape in this sector. A number of ACL providers were also active in the area of online learning, and one is planning a pilot blended learning course for 2013. The WBL providers saw online learning as less important in their sector, often citing their focus on specific skills which require face to face contact.

Question 2
Do you regard the rapid growth of MOOCs and other new online provision as a threat to your institution's interests? If so, is it likely that you will respond to the threat within the next three years? If so, in what ways? Do you think there is a potential in collective action, e.g. on an all-Wales basis, to support Welsh-medium learning or other areas?

HEIs differed considerably in views on whether or not MOOCs are threatening to their business. Some viewed MOOCs as an undeveloped market, and therefore not an immediate threat. Some respondents asserted that they were well placed to compete in this market, due to their prior experience, or their future plans. Others took an intermediate position, maintaining a "watching brief". Some of these had some experience in the online learning market, and may be aware both of the strength of the competition, and the issues involved (quality, marketing, and technical support amongst others).

A number of HEIs expressed a willingness to collaborate with other institutions, but one expressed an aversion to this (perhaps because this was interpreted as leading to the establishment of common infrastructure, as in 'Hwb'). One respondent was sceptical about the future of MOOCs, while acknowledging the wide range of views within the institution. This person also pointed to the need for staff to understand the issues involved in online learning, and stressed the key role of staff development in moving the agenda forward.

The 'Welsh language' part of this question elicited a range of responses amongst the HEIs, some of which indicated strong ambitions in this area. The FEIs were also very interested in this area, seeing it as an appropriate context for collaboration. Capacity to deliver in the Welsh medium is geographically variable, which lends itself to various forms of online deliver.

Question 3
Towards what aims and in which contexts do you think large-scale online learning would be of particular interest to you? (Widening access to higher education? Professional and workplace learning? International students?)

The following areas were highlighted as having potential by HEIs (with numbers of respondents in brackets):

- International Students (3)

- Widening Participation (2)

- Professional/workplace Learning/continuing professional development (CPD) (3)

- Marketing and Promotion (1)

HEIs often gave nuanced responses to this question, indicating awareness both of the potential and of the risks. For example, the 'international' market was seen as a risky area by some. One respondent mentioned that students from abroad were likely to need more support, and this may be best provided in person, rather than online.

We also spoke to a senior executive at Colleges Wales, which represents the FE colleges in Wales. He expressed the view that there were three key curriculum areas where open and online learning could have traction: staff development, Welsh Baccalaureate core, and additional work for gifted and talented pupils. The emphasis on professional development resonates with the aspirations of HEIs, and all of these views were consistent with the priorities identified by individual providers of WBL and ACL.

Question 4
What are the main barriers to taking action? How well prepared are your staff, and your technological infrastructure? Are there legal or commercial considerations? What are the main risks to you?

The issues which were identified are summarised here:

- Capability and capacity of teaching staff (6 HEIs; 2 FEIs)

- Strain on central systems (e.g. Academic Registry, student support) (4 HEIs; 1 FEI)

- Technical issues and capacity (2 HEIs; 2 FEIs)

- Quality issues (2 HEIs; 1 FEI)

- Copyright issues (2 HEIs; 1 FEI)

- Reputational issues (1 HEI)

- Resource 'greed', leading to knock-on impact on other provision (2 HEIs, 1 FEI)

- Releasing of valuable resources onto a 'free' market ('self-competition') (1 HEI)

- Risk of competing against 'big' providers (1 HEI; 1 FEI)

- Targets 'wrong' student groups (e.g. those who already have degrees) (1 HEI)

- Cultural issues, requiring the 'remodelling of the educational professional' (1 HEI)

- Workshop/laboratory based subjects (e.g. science) hard to teach at a distance (1 FEI)

There was a good level of agreement between the respondents about the main issues, across all the sectors. The issues centred on a limited capacity to manage the courses, coupled with a knowledge that their staff did not, by and large, have the required skillsets. This applied both to those HEIs with significant experience of online provision and those with limited experience in this area. Several respondents also recognised dangers 'downstream' of this, such as quality and reputational risks, and possible impact on their other provision, for example due to excessive demands on staff time. As expected, organisations with the greatest experience were able to articulate the full range of these risks.

All respondents envisaged a strain on their central systems. This was perhaps because they were imagining their institution 'going it alone' in some way, perhaps because only HEIs of very high status have secured contracts with e.g. Coursera. It may also be that they were sceptical about the ability or willingness of a MOOC platform provider like 'Coursera' or FutureLearn' to provide comprehensive backup. Again, this could create 'downstream' issues. For example, in the absence of a contract with a MOOC provider, technical capacity would have to include at a minimum some way of registering learners and recording their engagement, and if learners' achievement was to be recognised, much more sophisticated systems.

It was surprising that only two HEIs mentioned copyright issues; it may be that other HEIs were insufficiently experienced to recognise the potential significance of these. The HEIs who mentioned did not expand on this issue; we can speculate that they may fear staff unfamiliarity with licence terms, and a preponderance of existing resources which are not openly licensed and therefore could not be released as part of a MOOC. 'Unpicking' all of this could require quite a collective effort, coupled with some staff training.

WBL and ACL providers are concerned about the quality of the learner experience, and are aware of the complexities and costs of providing online

support for learners. They would probably be unwilling to go down this route without significant preparation of their staff.

Question 5
How should a satisfactory learning experience for students be guaranteed in large-scale online learning? How should accreditation of learning attainment be managed?

Some respondents used this space to identify further problems, others to suggest possible solutions, or criteria for success. There was also more divergence between the sectors over this question.

The HEIs identified the following:

Issues:

- Defining a 'satisfactory learning experience' is problematic (1)

- There is a tension between scale and quality. It may be impossible to assess student progress satisfactorily at scale (2)

- MOOCs may work best for learners who already have the skills (1)

Potential Solutions:

- Proctored examinations to ensure quality of assessment (3)

- Negotiation with accreditation agencies (1)

- 'Open Badges' approach, possibly linked to awards from professional bodies. (Two HEIs mentioned this; one has reservations about the approach.)

Criteria for success:

- Alignment with existing pedagogic practice (2)

- Alignment between accreditation strategies and course objectives (1)

- Alignment between assessment and QCF (1)

FEIs tended to re-state and elaborate on the issues, pointing out:

- Difficulties catering to the needs of individual learners (1)

- Verification and assessment (2)

- Does not align with current funding models (1)

However, these were not necessarily new issues to these colleges, and the following strategies were amongst those in use:

- Automatic release of learning tasks to individual learners on the basis of completion of a prior task (1)

- Regular feedback from students (1)

- Proctored exams set by WJEC, AQA, Edexcel (1)

WBL providers have less experience in online learning, and therefore have less to say about the management strategies. However, all of these providers mentioned e-portfolios, which currently have considerable traction in WBL across the UK. The widespread use of Moodle and e-portfolios in WBL and ACL could be seen as evidence that these sectors are preparing themselves for online or blended delivery, if not for MOOCs.

Question 6

We have asked a number of specific questions. If you have any related issues which we have not specifically addressed, please use this space to report them.

The following points were raised. These are paraphrased:

- Digital and Information Literacy skills amongst learners is a key constraint

- Small institutions will enter this market with caution

- An all-Wales MOOC platform would be a serious mistake

- We need to respond quickly to the 'MOOC challenge'

- Existing MOOCs are not well suited to the Widening Participation agenda. But MOOC-like offerings are possible, and could be designed

The following is an articulate overview of some of the key constraints (quotation from a Senior Manager at an HEI):

> "While MOOCs are great approaches for engaged, competent learners, to discover more about a subject in which they already have an interest, they are not a good model for inexperienced learners who are being stretched and challenged in their learning."

Conclusions

In relation to the Working Group's remit we have concluded that the majority of HEIs do not regard any competitive threat posed by MOOCs as very acute, or very immediate. However, HEIs are not ignoring the potential threat: all are keeping at least a 'watching brief', and two are actively engaged.

We suspect that the term "collective action" was interpreted in various ways by the respondents. Most were willing to engage in discussions which

might lead to more efficient provision, for example by scaling up courses, providing that quality was effectively managed. However, HEIs also value their ability to innovate, and the cautious response given by several to the last part of Question 2 probably indicates a scepticism about large technical projects.

The Working Group was encouraged by the level of agreement which was seen in relation to Question 3, which gave us confidence in the directions in which we chose to take our further investigations. Accordingly, the potential for using open and online resources (or courses) to support professional and workplace learning was also picked up by members of the Group in specific studies of Welsh language skills, widening participation and economic development.

The capacity of HEIs to deliver on this agenda is a key concern across the board. Some smaller institutions were less confident about MOOCs in particular, even those which were already successfully delivering online courses. It is presumably the 'massive' aspect of MOOCs which they found risky. This could be compounded by the feeling of exclusivity engendered by the high prestige of the institutions which have been offered contracts with providers such as Coursera and FutureLearn.

In Question 5, respondents focused on quality, rather than accreditation. Institutions which currently deliver online are committed to sustaining the same levels of quality in the online (or blended) provision as in their campus provision. They see this as a useful way for them to diversify while reaching out to more students, but certainly not as a way of reducing costs. Meanwhile, there is also widespread scepticism about 'mass' methods of assessment and accreditation. This is not surprising: current assessment methods which focus on manual teacher assessment translate easily to online provision, whereas it is hard to see how they might be applied to MOOCs.

This survey gives us a potentially useful 'snapshot' of the current aspirations in Welsh HEIs, with respect to MOOCs, and online learning more generally. There are outliers at either end of the spectrum: champions who appear to have embraced the idea wholeheartedly at one end, and at the other the sceptics who believe that little will have changed once the hype has died down. In the middle, we have quite a large cohort of 'positive sceptics' who can foresee issues, but are nevertheless prepared to experiment and to learn from their own and the collective experience.

We have used this information to inform our enquiries, and in a limited way help us to predict the shape of online education. We anticipate the continuing development of online courses, which may be judged by their performance in conventional marketing and quality terms. The tension between quality and scale will mean that the 'massive' part of the definition is likely to be the missing element. Difficulties in accrediting fairly, and in

supporting students to agreed quality standards, will mean that courses will not be entirely open or free. Meanwhile, the current consensus on what a 'MOOC' actually is may be increasingly challenged. We pick up many of these themes elsewhere in the report.

Acknowledgments

Appendix 4

List of abbreviations

ADL	adult community learning
cMOOC	connectivist MOOCs, with a high degree of learner participation
CQFW	Credit and Qualifications Framework Wales
FEI	further education institution
HEA	Higher Education Academy
HEFCW	Higher Education Funding Council for Wales
HEI	higher education institution
HESA	Higher Education Statistics Agency
HEW	Higher Education Wales
ICT	information and communications technologies
Jisc	charitable company championing the use of digital technologies in higher and further education and research (formerly JISC, the Joint Information Systems Committee of the higher education funding councils)
Jorum	Jisc's online repository of OERs
MOOC	massive open online course
NIACE	National Institute of Adult Continuing Education
O&O	open and online (courses or resources), including MOOCs and OERs
OEP	open educational practice
OER	open educational resource
RSC	Regional Support Centre
UfI	University for Industry
UKOER	Jisc's UK Open Educational Resource initiative
WBL	work-based learning