Openness, technologies, business models and austerity

Chris Jones, Liverpool John Moores University, UK.

c.r.jones1@ljmu.ac.uk

Open education emerged when the state had an active role in shaping and financing post-secondary education. In the 21st Century two pressures influence the way openness is conceived. The first is the compounding of neo-liberal economics with austerity following the financial crash of 2008. The second is the consolidation of networked and digital technologies at an institutional and infrastructural level, illustrated by Massive Open Online Courses (MOOCs). This article examines the place of open education in this emerging climate of economic constraint and technological possibilities.

The article argues that openness is not a property or feature of a technology but that such properties can result in affordances. This understanding informs a review of openness in The Open University (UK), in relation to MOOCs and in the OER movement. A relational view of affordance suggests openness depends in significant ways on the character of broad social process and that if they change then the affordances of technologies for openness change with them. The current marketization of Higher Education, the reduction in public finances and continuing economic uncertainty lead to contradictory and conflicting pressures. Arguing in favour of education as a public good the article criticises calls for a 'business model'.

Key words: Open, Open Educational Resources, austerity, affordance, assemblage

Introduction

This article examines openness in education and it begins with a brief review of the various meanings of openness and the way that the understanding of openness might be affected by the aftermath of the financial crisis of 2008. Open education emerged when the state played an active role in the late 20th Century. In the early 21st Century two separable pressures have influenced the way openness is conceived. The first is the compounding of neo-liberal economics with austerity following the financial crash of 2008. The second is the consolidation of networked and digital technologies at an institutional and infrastructural

level, illustrated by the developments and hype surrounding Massive Open Online Courses (MOOCs). This article examines the place of open education in this emerging climate of economic constraint and technological possibilities.

The article also argues that openness is not a property or feature of a technology, but that such properties can result in affordances. I argue that technologies have real affordances, which are relational in character, and they constrain the ways that the users of a technology can employ and understand that technology. Secondly I draw on the idea of assemblage by which I mean social forms that are emergent and dynamically assembled out of various relationships and associations between human, non-human and hybrid entities. These two separate theoretical ideas are brought together in a way that suggests that when assemblages are treated for analytic purposes as 'black boxes' the affordances of the assemblages can be found in the relationships between them and the humans, machines and hybrids that are external to the assemblage and make use of them.

Affordance and Assemblages

Affordance is a contested term and it has been used in a number of different ways in relation to technology, education and design. The way of thinking I want to propose is rooted in Gibson's work and it takes a broadly ecological stance that cuts across traditional dualities such as subject and object (Gibson 1977; 1986 [1979]). McGrenere and Ho (2000) argued in favour of Gibson's approach to affordance and explored an expanded notion of affordance that acknowledged that there could be varying degrees of affordance. McGrenere and Ho maintained that the availability of an affordance should be conceived of as more or less accessible and more or less discernable rather than in a binary form as being either present or not. Kaptelinin and Nardi (2012) argue the original notion of affordance has limitations in the way it understands mediation.

Therefore, Gibson's theory of affordances is limited in its support for understanding mediated human actions… this limitation of the framework significantly undermines its ability to serve as a theoretical foundation for studying action possibilities offered by technologies to humans. (Kaptelinin and Nardi 2012 p 971)

This limitation might be of particular importance in terms of openness because it identifies an issue with the aggregation of technological tools into assemblages. Kaptelinin and Nardi propose that to understand technological affordances it is necessary to adopt a mediated human action perspective. This approach provides a useful link between the Gibsonian conception of affordance and more developed theories of action with advanced technology.

Oliver (2005) has argued that the concept of affordance has drifted and that it is now too ambiguous to be useful and Derry (2007) has added to that criticism by noting that the term affordance has moved from its specific place in ecological psychology to a more loosely defined vernacular in which affordances were thought to be inherent in technologies. I think we have to take these criticisms seriously but my own reading of Gibson suggests that with the additions offered by McGrenere and Ho and by Kaptelinin and Nardi affordance remains an important and useful concept. The sense of affordance I want to use is that technologies have real affordances, which are relational in character, and they both enable and constrain the ways that the users of the technology can employ and understand the technology. A real difficulty with my view of affordance is the problem addressed by Kaptelinin and Nardi which might apply most specifically to complex socio-technical systems. Furthermore Kaptelinin and Nardi restrict their reconception of affordance to *human* action and I contend that this needs expansion to non-humans and human-machine hybrids when dealing with complex technologies that have forms of secondary agency. To deal with these issues I propose using the idea of an assemblage to describe complex socio-technical systems.

The term assemblage is probably most associated with Actor-Network Theory (ANT) and the idea is rooted in the social ontology of Deleuze (De Landa 2006) and later work by Latour (2005). Assemblage is not a well-defined notion but it treats society and the social as emergent outcomes of networks. The social from this perspective is not composed of fixed parts rather it is dynamically 'reassembled' (Latour 2005) from various forms of association between human, non-human and hybrid entities. Agency in this framework is an outcome of a network, a network *effect* and not an inherent property of any particular kind of agent, either human or machine. Humans are treated no differently to non-humans and in the networks between humans and machines they are capable of exerting force and through their mutual associations they co-constitute the different elements of the network.

Humans and what they take to be their learning and social processes do not float, distinct, in 'contexts' of practice that are a background of material stuff and spaces. The things that assemble these contexts, the actions and bodies that are part of these assemblages, are continuously acting upon each other to bring forth objects and knowledge. These objects might be taken by a casual observer as natural and given – as a 'context'. But a more careful analysis notes that these objects, including objects of knowledge, are very messy, slippery and indeterminate. (Fenwick 2012 p70)

The term used to describe stabilised assemblages in ANT is black box. The term black box applies to those stabilised networks that are outcomes of dynamic processes. When they are relatively stable assemblages can be treated as black boxes and the processes that produce their effects can be ignored. This applies at all levels and the ANT world can be thought of as a set of levels, temporarily stabilised, nested into each other, going up and down in scale to infinity. Each stable black box can be shown to be an assemblage of

other actors each of which in turn can be treated as black boxes that are more or less transient in time. To understand the affordances of assemblages it is necessary to think in terms of these provisional stabilities and the relationships between black boxed entities. I want to argue that using the idea of affordance with this understanding of assemblages can help to provide a critical understanding of openness and its relationship to technological change.

The various meanings of openness

The terms open and openness have taken on a range of meanings and in contemporary discussions the terms carry with them some powerful associations with broad social discourses. The Education Resource Information Centre (ERIC) provides the following definition for Open Education in its thesaurus

An approach to teaching and learning emphasizing the student's right to make decisions and that views the teacher as facilitator of learning rather than as transmitter of knowledge -- it may include such characteristics as vertical grouping, cross-age teaching, independent study, individualized rates of progression, open plan schools, and unstructured time and curriculum (ERIC Thesaurus, Open Education Online)

It can be seen that this definition focuses on choice and a broadly constructivist pedagogy. Other definitions can be found in relation to Open Universities and the lack of a requirement for prior qualifications (International Council for Open and Distance Education), and Open Learning (Commonwealth of Learning), which emphasises student choice in the medium, place and pace of study. Searches on other related terms such as Open Educational Resources, Open Educational Practices and Open Source yield further strands of meaning that inform the general use of the terms open and openness. This paper is not concerned with presenting a definition of open or openness but I do want readers to be sensitive to the different kinds of meanings attached to these terms. Not requiring prior qualifications is quite different to student choice and it is also quite different to the emphasis on no cost or 'free' that is associated with the idea of Open Access. The idea of open access usually refers to unrestricted online access to published articles and it is generally further subdivided into Gold and Green forms of Open Access (OA). In Gold OA the articles are made available by the publisher either directly, or after a delay (embargoed), or in hybrid forms in which the author pays to ensure open access. Green OA refers to self-archiving by the author (Laakso et al. 2011, Björk et al. 2014).

The following three core meanings for open will inform the discussion which follows:

- Open as choice

- Open as not requiring prior qualification
- Open as freely available

There are clearly other meanings that can be seen in the discussions about openness but for the purposes of this article these three core meanings will provide sufficient focus. The key issue I wish to address below is how these three meanings are related to the affordances offered by complex assemblages composed of technology, society, politics and economics.

Openness in context

The contemporary discussion of openness is taking place during the aftermath of the global financial crisis of 2008/9. The political and economic discussion has been dominated by a concern with austerity in advanced industrial economies and a desire for growth and development in the context of shrinking markets in developing economies. Following the banking crisis of 2008/9 governments increased their debt levels to stabilise the financial system and to secure the debts of banks. The watershed that followed the financial crisis set the tone of public debate, for example influencing the discussion of immigration and foreign student numbers. The financial pressures have also directly affected the funding of higher education in some cases, perhaps most starkly in the introduction of £9,000 (per annum) fee levels for most university courses in England. This policy change which was not signalled in the political party's pre-election manifestoes was driven through under the cloak of austerity and it has led to a number of perverse and unanticipated consequences. For example the changes in England may actually cost the government more than the previous system of block grants to universities in both the short and medium term (Chowdry et al. 2012, Thompson and Bakhradnia 2012). Austerity politics and government choices about the way to deal with the aftermath of the financial crisis have helped to set the context for the development of open educational ideas however they are defined. These contextual features are not fixed characteristics but they are the temporary outcomes of political choices and struggles between political and economic fractions of society, but at any given moment they provide opportunities and set limits to the available options for openness.

Openness, affordances and assemblages

The discussion of openness is also influenced by the discourses that surround networked and digital technologies. Just as economic decisions provide a context to openness so do the available technologies. Wiley and Green (2012) argued that education was essentially sharing and that OER enabled extremely efficient and affordable sharing. Wiley and Green clearly associate this new efficiency and affordability with technological change and specifically the Internet which they compare to the printing press in terms of its historic effects:

Clearly, the Internet has empowered us to copy and share with an efficiency never before known or imagined. However long before the Internet was invented, copyright law began regulating the very activities the Internet makes essentially free. Consequently, the Internet was born at a severe disadvantage, as pre-existing laws discouraged people from realizing the full potential of the network. (Wiley and Green 2012 p82)

For Wiley and Green the technology allows or enables cheap, almost free, reproduction and distribution of resources and it is only the legislative framework which holds back the technology's revolutionary potential.

However there is another view of technology which suggests that technologies are never neutral and that they always embody political choices (Winner 1986). For example Feenberg has argued that:

… technology is not a destiny but a scene of struggle. It is a social battlefield, or perhaps a better metaphor would be a parliament of things on which civilizational alternatives are debated and decided. (Feenberg 1991 p14)

Because technologies are a site of social struggle educational technology and OER are examples of these struggles. Struggle in this context is not only about the legal framework for OER, it is a struggle that involves the technologies themselves. Knox (2013b) has noted that the discussion of OER has tended to view access to online material as the main concern of the movement and that technology in this context is portrayed in essentialist and instrumentalist ways. The practices of openness rely on changing technological possibilities that are open to self-conscious redesign and to social and economic conditions which are open to often unpredictable political change. Openness is an outcome of this assemblage of complex and dynamic conditions which nevertheless have the appearance of being a relatively stable context. To locate these issues this article looks at three applications of the idea of openness, the open university movement, MOOCs and open educational resources (OER).

Open universities, access and choice

Just as there is no simple definition of openness there is also no straightforward definition of an open university.

I have employed the term 'open universities' to cover innovative distance-teaching higher education institutions that have used distance in radical ways to improve openness. I have not chosen to review in detail the range of meanings that support the terms 'distance teaching' and 'open'… (Tait 2008 p85)

Tait goes on to argue that an open university has a stability derived from its aims and that:

Open universities are, therefore, at their inception highly political institutions invented because of the inadequacy of the higher education sector to meet the challenge of modernity, defined both in terms of who is to be included in the goods of society and what society needs in terms of human capital. (Tait 2008, p92).

Open universities are concerned with broad social issues such as building capacity; individual opportunity and social justice; encouraging change in the higher education system and nation-building. Within this broad perspective any particular Open University also has its own history and mission which are related to the local political and social context.

The relationship of open universities to new technologies has varied, in part according to their chosen missions and political objectives (Jones et al. 2009). Jones et al. conclude that:

… the adoption of Internet and web based technologies is not determined simply by the development and availability of the technologies themselves but is deeply affected by institutionalised pedagogic practices. All three universities are located in advanced industrial countries with good infrastructure. However the use of Internet and web based technologies varies between them in style and quantity. (Jones et al. 2009 online)

This suggests that beyond the broad political purposes that lead to the founding of open universities there are historical developments in terms of the pedagogy adopted which affect the integration of technologies in the university and the suitability of particular technologies for the pedagogy deployed by the university. The Open University (UK) for example has developed its own pedagogical style Supported Open Learning (SOL). SOL is based on three key factors.

1. Distance or Open Learning
    a. Learning 'in your own time'
    b. Reading, undertaking set activities and assignments
    c. Possibly working with others
2. Resources
    a. Printed course materials, set books, audio and video cassettes, CD/DVD materials, home experiments, course and program web sites (previously broadcast TV programs)
3. Systematic support
    a. A course tutor, a regional network of 13 centres, central library and technical support
    b. Tutorial held within regions, day schools and online (e.g. languages, summer schools)

The SOL system implies cohort recruitment of students and this makes the OU (UK) distinct from the OU (NL) which can accommodate rolling recruitment of individual students who do not have to wait for the

start of a course with a cohort of others. The SOL system of support has changed over time as the university grew in size, and even prior to the recent discussion about Massive Open Online Courses the OU (UK) ran courses with enrolments of over 10,000. The changes to SOL have included adjustments in the models for participation in courses and in approaches to their production. (McAndrew and Weller 2005).

The pedagogic model at any one time is an outcome of interaction between the technologies deployed by an open university and the prior pedagogic practices that have become stabilised and embedded in the institution. Openness in an open university is an ongoing dialogue between political objectives (often expressed via the state), pedagogic practices (embedded in the institution), and the available technologies. Openness is not reducible to a simple definition because it is a complex assemblage of social, political and technological elements developed over time. The notion of openness that underpins open universities is a notion of access and choice and it is noticeably not one that is focused on being radically low cost or free. The Open University (UK) has always charged fees and these have been paid for by students without state supported loans or grants until the recent English student fee reforms, which for the first time opened up the student loan system to part-time students.

MOOCS and openness in a time of austerity

The contemporary context for openness in all its forms is the aftermath of the global financial crisis of 2008/9 and the politics of austerity that flowed from that crisis. The pressure in all public services is to reduce the cost of the service to the public exchequer. In some cases this means a displacement of costs, moving the cost of the service from the public purse to the service users, either by introducing a price and a market mechanism or by introducing a charge at the point of use to change the balance between public and private expenditures. In education there has been a flurry of interest in Massive Open Online Courses (MOOC) and the potential of these courses to allow for low cost access to knowledge. Early MOOCs began at about the time of the financial crisis and they were Canadian in origin and informed by a particular pedagogic approach based on connectivism and networking (Daniel 2012). The aim of these MOOCs was:

… to provide all who want to learn with access to available resources… empower all who want to share what they know to find those who want to learn it from them (Daniel 2012 p3)

It can be seen that this aim has a close affinity with an access notion of openness of the kind that informed OER. Popular interest in MOOCs and the growth of MOOCs has been spurred on since the original MOOCs by a separate but related development of another kind of MOOC which took a quite different approach to

teaching and learning. These new MOOCs have been distinguished from the original connectivist MOOCs (cMOOC) using the term xMOOCs.

Early in 2012 Stanford University offered a free, chunked course on Artificial Intelligence online and 58,000 people signed up. One of the faculty members involved, Sebastian Thrun, went on to found Udacity, a commercial start-up that helps other universities to offer xMOOCs (Meyer, 2012). MIT (2011) announced MITx at the end of 2011 for a launch in spring 2012. MITx has now morphed into edX with the addition of Harvard and UC Berkeley (edX, 2012). Since then similar initiatives from other well known US universities have come thick and fast. There seems to be a herd instinct at work as universities observe their peers joining the xMOOCs bandwagon and jump on for fear of being left behind. (Daniel 2012 p3-4)

Siemens (2012) has argued that it is not only the pedagogical approach that differs between x and c MOOCs but the platforms differ too because they are designed to serve two different purposes. Siemens' claimed that the cMOOC is designed for creation, creativity, autonomy and learning via social networks. In contrast the xMOOC platform is designed for an instructivist and traditional learning paradigm using presentations via video and testing. It was this second wave of activity that gave rise to a growing political, policy and public interest in MOOCs and the broader issues concerning whether MOOCs provided a challenge to traditional university structures. In early 2013 the Institute for Public Policy Research, a generally respected UK think tank produced an essay entitled: "An avalanche is coming: Higher education and the revolution ahead" (Barber et al. 2013). The challenges to universities are clearly identified by the authors as arising from MOOCs which they characterize as an opportunity opened up by technology. The three fundamental challenges the authors identify are:

1. How can universities and new providers ensure education for employability? "Given the rising cost of degrees, the threat to the market value of degrees and the sheer scale of both economic change and unemployment, this is a vital and immediate challenge."
2. How can the link between cost and quality be broken? "in the era of modern technology, when students can individually and collectively create knowledge themselves, outstanding quality without high fixed costs is both plausible and desirable."
3. How does the entire learning ecosystem need to change to support alternative providers and the future of work? (Barber, Donnelly and Rizvi 2013 p 6)

The first two challenges are explicitly linked to costs and the third is a less explicit but open call for the inclusion of private (for profit and other) institutions in higher education.

The rapid expansion of MOOCs has sparked commercial interest from venture capitalists and major corporations who want to enter the HE market using a MOOC approach. (Yuan and Powell 2013 p5)

The drive to lower costs and to encourage new providers has been directly linked by universities representatives to the potential of MOOCs.

MOOCs may also help to restructure and lower the costs of higher education in ways that might be attractive to learners looking for lower cost provision and which presents opportunities for new and existing providers (Universities UK 2013 p2)

The assessment of the costs and resources required to produce a MOOC are still unclear despite recent research, and they vary significantly between courses (Hollands and Tirthali 2014). Nevertheless the link between MOOCs, new private providers and costs is clear. However the association of MOOCs with openness is less certain, even though such a connection is sometimes assumed.

Futurelearn is a UK government supported MOOC platform spun out from The Open University (UK). It is wholly owned by the Open University and operates with a number of partners including other universities, the British Council, the British Library and British Museum. Although clearly a UK based offering Futurelearn includes some international partners (Jones 2014). The Open University is also a partner in a European MOOC project launched in 2013 OpenupEd which is supported by the European Association of Distance Teaching Universities (EADTU). Both these initiatives mention open access to resources, although the commitment of Futurelearn is limited. Yuan and Powell (2013) note that:

… ambiguities in the concept of MOOCs may pose a threat to the future development of open educational resources and open courses where the general public will perceive 'free' is good enough and no one will care about 'open'. This raises questions about the licensing and permissions of current MOOC provision and how it relates to the creative commons licenses promoted by the OER community.
(ibid p6)

It remains to be seen to what degree the principles that inform these new MOOCs will be drawn from the longer tradition of Open and Distance learning from which they emerge and to what degree they will abandon these principles and simply replicate the instructivist model of xMOOCs.

MOOCs are an outcome of changing possibilities which rely on technological capacities and a dynamic social and political context, informed by the effects of the financial crash in 2008 and the increasing long-terms costs of education. These factors come together to cohere in an apparently stable form, the MOOC, which is described in a simple binary as being either c or x MOOCs. This apparent stability rests on the dynamic processes being black boxed or 'punctualised' (Law 1992). The precarious achievement of the MOOC is effaced and the MOOC appears as a stable and describable phenomenon.

Open Educational Resources

Open Educational Resources make the knowledge generated in universities, and other institutions freely available online for anyone to use. This idea of openness includes a notion of no cost or low cost access. Wiley et al. (2014) state that OER are educational materials which use a Creative Commons license or which exist in the public domain and are free from copyright restrictions. Although the OER movement is recent Pegler (2013) points out that the term open content was in use by 1998 and the idea of openness cuts across earlier initiative such as The Open University and open source software (Selwyn 2014). The idea of openness as it is used in OER can include being free to the user, immediately accessible online and being available for further distribution and re-use with the author only retaining attribution rights (Sclater 2011). These definitions of OER raise a number of fundamental questions concerning who actually pays for the production and distribution of OER because OER are not cost free even if they have no price attached to them and they are free to the end user. The openness of OER raises basic questions about the institutional form of the university, and perhaps about all the institutional forms involved in generating knowledge (Selwyn 2014). The university and other public bodies (e.g. libraries) are central to the development not just of open resources but of the organizational and institutional arrangements that support and sustain open development, curation and re-use.

The term OER includes some diverse elements and Sclater (2011) reports that the definition of OER developed by UNESCO at meetings in 2002 and 2004 included the following areas:

- Learning resources
- Courseware, content modules, learning objects, learner support and assessment tools, on-line learning communities
- Resources to support teachers
- Tools for teachers and support materials to enable them to create, adapt and use OERs; as well as training materials for teachers; and other teaching tools
- Resources to assure the quality of education and educational practices

The diversity of the kinds of OER that are being developed and the broad nature of the idea of OERs means that open resources can be seen as a contrast to the extensive attempts to restrict access and provide a pricing mechanism for privatised intellectual property. Merton (1942) used the term Communism as one component in the institutional norms of science (CUDOS: Communism, Universalism, Disinterestedness and Organised Skeptisism) to emphasise that the outcomes of scientific research should be the common

property of the scientific community. In contemporary conditions intellectual property is conceived of in individualistic terms and in relation to criminal sanctions, commercial advantage and monetary value (Manta 2011). Advocates of openness have argued strongly against strong protection of intellectual property and for a variety of less restrictive licenses, most notably the Creative Commons licenses (Lessig 1996, Lessig 2004). OERs understood in this way form part of a long historical argument about the place of intellectual property in the acquisition and circulation of knowledge and in the tension between social forms of production and individual appropriation of rewards.

The tension between the social and the private goes beyond intellectual property and OER have a potential to support education when it is thought of as a public rather than a private good (Longden and Bélanger 2013). While higher education benefits the person, by way of their particular capacities and potential career trajectory, it is also a core component of civic life, a way to transmit culture and civilisation. Sclater notes that this social impulse gives OER an implicit if not explicit political agenda:

While there are potential commercial motivations too… the desire to give something back to society is arguably the strongest driver for the organisations and individuals in the OER movement. An analysis of the open content phenomenon is therefore heavily influenced by the wider socio-political agenda, as defined by representatives of developing nations as well as the charitable foundations who have driven and provided much of the funding for OER projects. (Sclater 2011 p180)

Selwyn (2014) has argued that OER have their supporters among both left leaning advocates of collaboration, flat-hierarchies and worker/producer control and on the right by neo-liberal influenced libertarians attracted by the possibility of reduced 'interference' by institutions and the state. He argues that when the notion of OER leads to shrill calls for change itey often cloaks wider ideological agendas.

…much of the current enthusiasm for openness is (un)consciously yoked to wider ideological motivations of re-engineering and reorientating the social relations of educational technologies and educational institutions. (Selwyn 2014 p75)

Phelan places the politics of OER in the longer historical perspective of open education that includes open universities.

Open education historically and currently embodies a very clearly defined politics, centered strongly in a commitment to access and equity. In contrast, distance education programs may or may not be grounded in a commitment to access and equity…The politics of access and equity is even starker with regard to OER. Making learning materials freely available to all with adequate Internet access at least suggests a

potentially radical broadening of access to learning. However, as with distance education, it may not necessarily be so. (Phelan 2012 p280)

Although the potential benefits of OER may seem obvious there are many practical issues to surmount to make OER genuinely useful.

OER can be used to cheapen production costs in existing institutions rather than to expand the pool of available resources. If exiting institutions follow this route the potential for OER could be self-defeating with the ongoing supply of OER drying up. An additional risk comes from the need for technical support staff who can convert existing materials into OER format. Furthermore there is a need for translators who are required to translate OER into other languages and to prepare them to reflect varying cultural nuances to enable the transfer of OER to a global user base. For OERs to work as they are intended there are attendant cost in time and money required to localize and facilitate the re-use resources even if they have been made available and free to use (Caswell et al 2008).

The need for contextualization has been recognized as a challenge for OER (Wiley et al. 2014) although Pegler (2013) argues that translation alone can lead to positive benefits including allowing users rather than suppliers to lead decisions and spread large quantities of resources. There is a considerable effort required not only to translate resources into different languages but to make them available in a new context. Resources made freely available by Ivy League universities located in the USA might not be readily absorbed into linguistically, culturally and politically diverse contexts. It could be that the eventual users repurpose the resource but that then raises questions about how that effort in repurposing is going to be supported and sustained. OER do not remove the requirements for institutional support for the work necessary for education even though they might displace them and generate new or reformed institutional approaches.

Knox (2013a) argues that in current discussion of OER there has been an under theorization of openness but at the same time there has been a contradictory process that both privileges and rejects institutional authority. OER diminish the role of pedagogy by emphasizing a learner-centric model of education that rests on assumptions of an unproblematic self-direction and autonomy. Phelan (2012) for example makes a case for autodidacticism, for a radical reconceptualization of the learner and by implication the reduction of the requirement for the teacher and teaching in higher education. Knox suggests that in this emphasis on individual development OER are in alignment with the contemporary needs of capital in which the learner is enabled to continually seek new and relevant knowledge and to develop themselves into a more desirable educated and flexible labour commodity. Knox comments that:

The use of OER in the absence of institutional structures, with their in-built teaching frameworks and pedagogical and subject expertise, implies that individuals are able to manage their own educational activity without difficulty. (Knox 2013a p826)

The contradiction at the heart of OER is their reliance on institutional support and authority and at the same time being used to promote individual autonomy independent of institutions. This contradiction will affect the kinds of design and development we can expect in the technologies deployed for OER and in the regulatory and organisational frameworks governments and institutions adopt. Universities and institutions could be reduced to the core functions of warranting and credentialing which were envisaged by Brown and Duguid (2000) when they spoke of universities as DGB – Degree Granting Bodies. The oddness of this process is that the prestige of many OER initiatives comes from their host university (e.g. MIT), a prestige that derives from a fully rounded institutional history rather than simply their capacity to provide credentials.

Selwyn (2014) identifies a set of 5 issues raised by the suggested benefits of OER. These issues include:

1. Tensions between individual competition and 'communal' production
2. Power imbalances within open processes of production
3. Mass consumption of openly produced products
4. The limited outcomes of open production processes
5. Open production as a site of exploitation and commodification

It can clearly be seen from this list that Selwyn's focus is largely on the processes of production, whereas Knox was concerned with the practices of consumption of OER as part of an educational process. Even Selwyn's concern in point 3 with mass consumption is focused on the division between an elite of producer innovator-users and a majority (mass) of consumers. The most important element of Selwyn's criticism is to ground the discussion of a flat OER gift economy, in which hierarchy is minimal and products are circulated at minimum cost or free, in the realities of the capitalist market economy based on wage labour, commodity production and profit. The contradictions inherent in OER leave them exposed to being used in profoundly conflicting ways, as a covert way to destabilise public institutions and open them to the market and commercial interests or as a libertarian release from institutional constraints. The one common weakness in the two competing discourses is that they rely on a set of determinist premises that minimise the socio-material constraints that the introduction of OERs faces.

Internet technologies were not implicated in the early conceptions of openness and The Open University was conceived during the late 1960s when media were largely analogue and the distribution of audio and video elements in teaching were achieved using radio and TV (Tait 2008). Openness has since become

intertwined with Internet technologies and there is an assumption in some areas that technology is the basis for open education (Peter and Deimann 2013). Peter and Deimann note the way key writers have placed an emphasis on technology even though the authors they refer to also include factors additional to technology in their accounts. Wiley and Gurrell (2009) stress the legal framework which they argue tempers and constrains technological possibilities and Weller (2011 :7) argues that openness "is both a technical feature and a 'state of mind'". The state of mind Weller refers to is the practice of sharing content, by which he means data, journal articles, teaching materials and social processes such as seminars, discussions and commenting. The point I am making is that openness is never merely a feature of technology it is always associated with law and social practice. This makes openness more than an individual orientation, more than a state of mind. Openness is an outcome afforded by the interaction of a variety of contending factors organised into a dynamic assemblage. In this I agree with both Peter and Diemann's (2013) historical approach to OER and with Tait's (2008) history of open universities.

The economics of openness

I noted earlier that a significant policy pressure in favour of open education since the financial crisis has been the desire to reduce costs to the exchequer. This is related to a claim about networked technologies and the way the Internet affects costs and transactional costs in particular (Wiley and Green 2012). In these accounts the technology is thought of separately from social and political factors so that in Wiley and Gurrell's (2009) argument law constrains technologies that would otherwise provide definite cost benefits. A similar separation can be found in this comment on OER:

…the Open Educational Resources movement has turned the web into a universal educational library of lecture materials, and well produced educational resources available to all. This is a significant shift for education because it provides access to educational materials to anyone who has Internet access. It is a wonderful democratisation of access to resources. But it is not the same as access to education. (Laurillard 2013 pxvii)

Laurillard is careful to separate education from access to resources, but she presents the relationship between the OER movement and web technology as largely unproblematic. I want to argue that the relationship is more layered and more complex, and that openness is an affordance of an assemblage and related to broad social conditions, national politics, economics and law.

Firstly I want to make a distinction that may seem obvious but it is one that is commonly ignored, that is a distinction between cost and price. The cost of something can be thought of in terms of the activity that is required to achieve the outcome, whether it is a service or a physical item. Price is the monetary charge

placed on a service or item in the market. This distinction is related to the labour theory of value and the idea of use value and exchange value found in Marx (for a discussion of use value in the context of the Internet see Fuchs 2008: 65-68). An example of this distinction in current conditions is the debate about university fees in England and the USA. The cost of education is related to the inputs to the system in terms of the materials and labour that are required to supply an educational system. The price of education to a prospective student is the level of fees that the university charges. The important feature of the difference between costs and fees is that while the price of education for the student is rising in England the cost of education to society is not. The European University Association showed a fall in the percentage of GDP spent on university funding between 2008 and 2013 in 10 EU countries and an increase in eight (EUA 2013). In the UK (England and Wales) they found that university spending is falling as a proportion of GDP. After rising from 2008 to 2011, expenditure fell to 0.46% of GDP, with only Hungary Italy, Portugal and Greece having lower proportional expenditure.

The price in the market is an outcome of a complex interaction between political decisions, university policy and the economic requirements for costs to be covered in the overall educational system. This applies to the costs of open practices too. The Open University UK was a social democratic endeavour, inspired by the need to open access to higher education. The costs to society were always balanced by fees charged to students but the social cost was born by government to secure a valued objective. Open access to educational materials also has costs. The UK government has made a commitment to providing open access since 2005 and in 2012 following the Finch report it outlined a policy, with a transition period of five years, that supported both Green and Gold access to peer reviewed research outputs from funded projects (RCUK 2013). This policy was supported by a commitment from the UK research councils to fund the costs of Open Access through the block grant system to universities. Open Access has costs associated with the production, distribution and the translation of open materials to make them accessible. The openness of OA is openness in terms of price - that is they are free to the user. It should be noted how this differs from the earlier social democratic OU model which was not free to the user but which accepted that there was a social cost to education and that the burden of cost was shared between the student who paid fees and the nation state which supported many of the other costs of the university.

A central feature of debates about OER has been a concern to find a 'business' model to ensure the sustainability of the OER process. There are two interrelated issues concerning the sustainability of OER, the first is being able to maintain a base of users and the second is financial (Wiley et al. 2014). Pegler notes that OER based on existing resources which are the by-products of conventional educational practices require less additional resourcing (Pegler 2013). As a consequence she also argues that new resources that are created purely for OER require 'an exceptional flow of funding or effort' (ibid p149). This positions

Universities in a central role in the development of OER because they provide a financially sound and relatively permanent basis for organising the effort required to either repurpose existing resources or to develop new ones. Because universities are collectively the potential beneficiaries from this development effort it might make sense for governments, or the universities organised collectively, to reward and incentivize staff to generate and support OER. A 'business model' for OER without such institutional support from a university or from government could lead to the kind of dystopia outlined by Selwyn (2014) in which OER lead to the 'corporate misappropriation' of free labour and exploitation of work supplied for moral reasons. The important point I want to make is that 'free' OER are not simply the consequence of reduced transaction costs related to the technology of the Internet and Web and being free at the point of use disguises other funding sources (charitable, governmental etc) that defray the costs and allow cheap or no cost access to the user. OER are an effect of an assemblage of political, social and economic factors and must be considered in relation to this dynamic combination of forces.

Furthermore the ability to find OER is not simply a technical question even though it necessarily involves the development of standards and specifications (Wiley et al. 2014). To make OER discoverable requires frameworks that allow major search engines to provide properly focused results. The technical question of discovery points to a displacement and repositioning at the heart of OER. OER are positioned as an outcome of co-production and voluntary effort, but they also require complex technical support. Because of this rather than replacing resources controlled by publishers and institutions with cooperatively developed alternatives, OER replace one system of organization and power with another. In the case of OER this may be one dominated by technical experts and administrative requirements rather than publishers and university administration. If support for OER does not come from public bodies, such as governments and universities, the OER movement could lead to control of the system residing with atechnological elite, a narrow band of activist producers, and a corporate takeover of the business side.

Conclusions

This article has argued that openness is a term with several meanings and the currently most popular view, related to OER includes a notion of low or no cost resources. This was contrasted to the earlier notion that underpinned the Open University that focused more closely on access to higher education and included a fee for students who could enrol with no prior qualifications. Three main notions of openness were identified, the idea of openness as choice, the idea that openness meant not requiring prior qualifications and the notion of openness as being freely available. It can be seen that the construction of openness that informed the OU is quite different to the idea informing OER but that both had elements from the three positions. The OU has never been free but it was available to those without prior qualifications and gave them a degree of choice that was previously unavailable. OER allow access to many people who previously had no choice about whether they could access higher education materials or courses. The social and

political aims that gave rise to these two approaches to openness are markedly different and the technologies that supported them are also distinctly different. How then are we to understand openness and its relationships with technology?

I suggest that we need to think of examples of open practice and the development of open technologies as assemblages. Technology cannot be treated as a discrete and separate component and contrasted with other fixed elements of a context, such as law or educational practice. I argue that the technologies used to support open practices are themselves products of struggles between contending social forces and they are embedded in complex socio-technical systems in which the technology is inseparable from other social, economic and material factors. Assemblages are time sensitive comings together of a variety of material, social and technical elements. Openness is not a feature of one technology or another but the technologies deployed to support different socio-technical systems can delimit the range of possible options and constrain available choices. The affordances of technology do not reside in essential features of socio-technical assemblages rather they are found in the relationships between assemblages and those that use them. The affordances of an open educational system for a large corporation interested in entering a higher education market are quite different to the affordances of the same technological system in relation to an individual student interested in understanding a set of ideas or developing a particular skill. The affordance is real and does not depend on how it is viewed because it relies on the real relationships between the parties to the affordance.

In the current climate of austerity governments are driven by a desire to reduce costs to the state and institutions are driven by reductions in the grants provided by governments. It could be assumed that these cost pressures would easily translate into a pressure for open educational practices but this might not be the case. Government policies are driven by a reduction in state expenditure but this can lead to an increase in price to students as with the introduction of fees in England. Governments are also driven to reduce their commitment to higher education by encouraging new entrants. Large corporations such as Pearson and Laureate are engaged in educational provision and often brand their activities in terms of opening access. Large technology corporations such as Google and Microsoft are engaged in supplying basic infrastructure to universities, some of which is increasingly cloud based even though it is branded by the university. The technologies deployed and the way these technologies interact with open agendas will be decided in government ministries, corporate boardrooms and at senior management levels in universities. The technologies are not fixed and they will be developed according to the agendas that emerge from this highly political process.

My contention is that no technology determines the openness of educational processes but large scale assemblages of technologies do stabilise and can be considered as black boxes for the purposes of analysis.

These black boxed assemblages have effects that can be understood in terms of affordances, even if they do not determine outcomes. Affordances are relational between different entities and they are not essential elements of the technology. In terms of openness no technology provides or guarantees openness which is an outcome of the interaction between technological, political and economic factors. It is because of this relational nature of affordance that austerity and the politics and policy it is related to influence the technologies deployed to enable openness. My own view of openness is that it relies on public support organised via institutions. Education is a public good and should be collectively sustained. At the heart of the OER movement there is a contradiction between reliance on institutional support and the promotion of individual autonomy and self-learning independent of institutions. For openness to be achieved we need more than the technologies that allow open interactions, we need public policies that support open relationships.

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