

The limitations of access alone: Moving towards open processes in education technology

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Abstract

“Openness” has emerged as one of the foremost themes in education, within which an open education movement has enthusiastically embraced digital technologies as the central means of participation and inclusion. Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs) have surfaced at the forefront of this development, claiming unprecedented educational reform. This paper provides a critical perspective on these prominent initiatives, highlighting a tendency to view access to online material as the principal concern of the open education movement. It will analyse the portrayal of technology in academic literature and media coverage of OERs and MOOCs, suggesting underlying assumptions of technology instrumentalism and essentialism. Alternative perspectives will be offered, drawing on critical technology studies and the philosophy of technology. The inclusion of “open processes” is proposed, involving the active engagement of learners in participation and dialogue, as well as further critical explorations of the relationships between technology and education.

Keywords: access; critical education technology; MOOC; OER; online education; open; open processes

Introduction

A burgeoning open education movement is becoming established around an agenda of institutional transformation, calling for unrestricted access to educational materials and the diminishing of geographic and economic barriers to participation. At the forefront of this movement have been Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs), educational projects which claim significant advances in utilising Internet technology. Emerging from MIT’s OpenCourseWare project in 2001, OERs have received considerable endorsement from educational institutions worldwide (Caswell, Henson, Jensen and Wiley, 2008; Wiley & Hilton III, 2009; Hylan, 2006), and various government-supported or non-profit initiatives have surfaced in recent years (POERUP, 2012). OERs have also garnered recognition from international organisations, such as UNESCO and the European Commission, the former developing policy guidelines for the implementation and standardisation of OERs in higher education (UNESCO, 2011), and the latter seeking a public consultation on “opening up education” (European Commission, 2011). The MOOC began as a fringe experiment in networked learning (see Siemens and Downes 2008; Mackness, Sui Fai Mak & Williams, 2010; McAuley, Stewart, Siemens & Cormier, 2010) before being reconstituted and adopted by prominent universities. These institutionalised MOOCs, offered by Silicon Valley start-ups “Coursera” and “Udacity” as well as the Harvard and MIT collaboration “edX”, have received significant media attention, which has often inferred a radical destabilisation of the higher education sector (see Adams, 2012 and Marginson, 2012).

These high-profile initiatives are representative of an apparent commitment and enthusiasm towards technology within the open education movement. However, despite the centrality of networks, systems and software, the technologies associated with open education appear to be rarely subjected to in-depth consideration, beyond the analysis of user interpretations (for example Fini, 2009).

Methodology

This paper will provide a critical perspective on open education and its technologies. It will analyse selected academic literature and media coverage of OERs and MOOCs with the intention of understanding how “openness” and technology are understood and disseminated within the field of open education. It will highlight ways that “openness” is typically framed, and these perspectives will be related to assumptions about the role of technology in education.

Theoretical frameworks associated with the philosophy of technology (Dahlberg, 2004; Kanuka, 2008) and critical technology studies (Friesen & Hamilton, 2010) will underpin this analysis. While open access to learning resources may be of significant value in education, this paper will question whether free admittance to information is enough to realise the goals of universal education and economic prosperity often promised by the open education movement (see Atkins, Brown & Hammond, 2007; Caswell *et al.*, 2008; Daniel & Killion, 2012). “Open processes” are suggested as one way in which open access can be developed, requiring further acknowledgement of the complex relationships between technology and education.

Openness as access

The open education movement has tended to define “openness” in terms of “access” to educational material. This reflects an affinity with distance education, developed to address the geographical barriers to institutional contact (Downes, 2011). Much of the OER literature focuses on issues of access, and this has centred research around strategies for implementation or the development of supporting infrastructure (see Johnstone, 2005; Atkins, Brown & Hammond, 2007; Caswell *et al.*, 2008; Downes, 2011; Macintosh, McGreal & Taylor, 2011). OERs are founded on the idea of an information repository, exemplified in the proliferation of resource archives on the web (see OpenLearn, 2012; Connexions, 2012 and WikiEducator, 2012). Trust in particular OER repositories has been highlighted as a major factor in their adoption by teachers (Clements & Pawlowski, 2012). This tends to structure open education around a privileging of reliable sources of information as the prime factor in the learning process. Within this arrangement the role of teaching is often overlooked, and the chief concern becomes bringing learners into contact with trusted supplies of knowledge. Potential problems with OERs are often framed simply as “getting access to a high-speed Internet connection”, immediately followed by “once that problem is solved, the various types of resources can be quite useful” (Johnstone, 2005).

The institutionalised MOOCs advance a similar view on the idea of “open”, frequently promoting large-scale access. Coursera (2012a) proposes “to give everyone access to the world-class education that has so far been available only to a select few”, utilising technology which “enables the best professors to teach tens or hundreds of thousands of students”. The promotional content on the edX website similarly emphasises a desire to provide access to unprecedented numbers of students, with the president, Anant Agarwal, declaring “our goal is to educate a billion people around the world” (edX, 2012). Udacity underscores this trend, stating, “using the economics of the Internet, we’ve connected some of the greatest teachers to hundreds of thousands of students all over the world” (Udacity, 2012). These MOOCs operationalize the view that “open” constitutes an amplification in the number of participants coming into contact with their educational offerings. While these initiatives emphasise interactive features rather than static content, the dominant message is of the quantity rather than the quality of access.

Assumptions about technology

The dominant interpretation of openness as “access” may be bolstered by underlying assumptions about technology prevalent in educational research: those of instrumentalism and essentialism (Friesen & Hamilton, 2010). These philosophical perspectives conceive of technology either as entirely neutral, merely enabling the aims of educational endeavours but not influencing them (instrumentalism), or to possess intrinsic qualities (essentialism). The open education literature often depicts technology in a role of facilitating or empowering the learning process, however this stance tends to render the technology transparent in the resulting activity. Caswell *et al.* (2008) state, “new distance education technologies . . . act as enablers to achieving the universal right to education”. They go on to define technology according to its ability to straightforwardly reproduce and distribute educational content, yet the degree to which these systems might affect that content is not discussed (Caswell *et al.*, 2008).

This perception of technology neutrality is reinforced through the common educational designations “resource” and “tool”. Framing technology in this way “establishes a one way direction of cause and effect” (Feenberg, 2005, p. 48), in which the user of the tool is unaffected by the activity. The archival tendencies within the OER movement emphasise this relationship in which technology is positioned as a prosthetic to the learning process; an instrument considered only in its capacity for enhancement. This tendency for instrumentalism limits technology research to studying either the improvement or diminishing of learning (Friesen & Hamilton, 2010), and it is often the former that manifests in open education literature. This masks the ways in which the networks, systems and codes of open education might transform and affect the learning process. The open movement might look to Actor-Network Theory (ANT) in education (Fenwick & Edwards, 2010; Nespors, 2010; Edwards, Fenwick & Sawchuk, 2011) as a way of acknowledging the constituent role of networks and software in educational activity. ANT involves a redefinition of the notion of agency to include non-human elements. It is therefore a theoretical framework which can be used to consider how technologies influence and affect the human beings and environments in which they are involved.

Within OER literature, technology is also frequently inferred to possess the qualities attributed to its users.

Jay connects to the Internet via his laptop and mobile phone (he is *mobile*) in order to search Google for information (*digital* resources are *open* for him to freely access) . . . he chats with friends on the phone and by Instant Messaging (IM) to see if they can assist in his search (he is *connected* to other people) (Wiley & Hilton III, 2009 emphasis original).

In this hypothetical scenario, technology appears to function seamlessly with the various activities of the learner, possessing qualities that resemble the innate desires of the human being putting it to use. Wiley and Hilton III (2009) go on to describe technology as embodying the organisational changes required if higher education institutions are to reflect wider society. They suggest “connectedness, personalization, participation, and openness” as four key areas for educational transformation (Wiley & Hilton III, 2009, p. 8), yet each is suggested to transpire almost exclusively through technological means and from systems which appear to unproblematically personify these qualities.

The technologies of open education are too often implied to have an “independent and abstract pedagogical value” (Friesen & Hamilton, 2010, p. 8). This is often predicated on idealised interpretations of the Internet, sometimes assumed to be necessarily open through its capacity to increase access (see Brown & Adler, 2008). OERs are thus promoted as “technology-empowered . . . to create and share educational content on a global level” (Caswell *et al.*, 2008). This discourse of facilitation or empowerment forms a powerful rhetoric of educational change, yet it is too often embodied in the technologies of open education, rather than considered ideal or potential practice.

The hidden production of technology

The dominant assumptions of instrumentalism and essentialism shift attention away from the often complex ways that technology is designed and produced. Considerable work is needed within the open education movement to unveil the processes involved in the production of technology, acknowledging the broad pedagogical, philosophical and political presuppositions already encoded in the systems used. The practices of standardisation and coding have been highlighted as rarely acknowledged factors in the use of educational software, constituting a hidden curriculum (Edwards & Carmichael, 2012). This approach does not suggest that there are intentionally unproductive or malevolent forces being covertly imbedded into educational technologies, but rather that the effects of standardisation and coding practices cannot be predicted in their entirety (Edwards & Carmichael, 2012). This means that technologies have the potential to constrain as well as enable subsequent learning activities, influencing “the potential discourses, trajectories for inquiry, and student subjectivities that might emerge from such a learning environment” (Edwards & Carmichael, 2012, p. 12). This work is highlighted here to suggest that alongside discussions of the ways that technologies facilitate and support educational practices, an acknowledgement of the necessary limitations brought about through the production process is required if educators are to work towards a balanced understanding of technology use.

Therefore, while a particular digital technology might be deployed in accordance with acknowledged pedagogical theory, the coding embedded within the system can limit what is ultimately achieved. Coursera’s webpage on “Pedagogy” claims that:

A key factor in the design of the Coursera system is the extensive use of interactive exercises, which we believe are critical for student engagement and learning. Even within our videos, there are multiple opportunities for interactions: the video frequently stops, and students are asked to answer a simple question to test whether they are tracking the material (2012b).

Aligning the Coursera system seamlessly with the educational rationale of interactivity deflects a consideration of the ways in which such technology might itself promote particular degrees of inflexibility. For example, the moment at which a pause comes about in these video lectures will be predetermined, solidifying particular pedagogical assumptions about the correct time to activate formative assessment. Furthermore, the production of video itself necessitates distinct framings and arrangements of pedagogical activity, simultaneously hard-coding the communicative patterns of traditional didactic lectures into the very systems which claim innovation and interactivity. This is not to suggest that the production of technology should be granted more attention than the often valuable ways in which it is employed for educational purposes, but merely to call for its inclusion as a constituent factor.

Participation and open source culture

The ability to modify and repurpose OERs has been a central strand of their promotion. The notion of “remixability” is often posited as a way to ensure flexibility and relevance to differing cultural contexts and pedagogical practices (Brown & Adler, 2008; Downes, 2007; Hilton III, Wiley, Stein & Johnson, 2010; Johnstone, 2005; Wiley & Hilton III, 2009). However, true to form, technology is too often neutralised in the activities of repurposing. “Editing, adapting, or otherwise changing educational materials to be more appropriate for a specific use is technically straightforward thanks to the variety of technologies currently available” (Wiley & Hilton III, 2009, p. 9). Here the principles of remixing are proposed to transcend the technologies which make them possible. However, this orientation masks the ways in which the very activities of editing and adapting evolve from

technology infrastructure and design, as much as they do from human inclinations. The repurposing and adapting of digital content does not begin and end with the desires of the person doing the remixing, but emerges from interactions with what is made possible through the predetermined code present in the software.

Open source software, the movement from which the open education agenda has largely derived (Caswell *et al.*, 2008), offers one way for these hidden coding practices to be further exposed. The edX platform, as well as the new “CourseBuilder” venture from Google (Course-builder, 2012), are promoted as open source, signalling a possible move towards more open and participatory practices. However, as Edwards and Carmichael (2012) caution, open source culture, rather than promoting detailed examinations or analyses of code, often encourages the practice of assembling software from pre-written component parts. Such ‘openness’ may well serve the purposes of software production where the objective is to create a functioning program rather than to understand how it works. However, ‘openness’ in education could seek more than this. If technologies do indeed limit, but also enable, particular forms of learning, understanding how software functions could be integral to the fostering of critical thinking skills, promoting a culture of openness in which *how* we learn is given as much consideration as *what* we learn. Rather than promoting the idea that openness simplifies technology, continued research in open education may benefit from perspectives which acknowledge the growing intricacies and amalgamations which influence its production. Beneath increasingly mild and effortless user-interfaces or expanding compatibility across platforms and devices lies deepening complexity. For the open education movement to render such efforts transparent, constitutes a kind of “benevolent concealment” (Edwards & Carmichael, 2012, p. 6).

The fetishization of knowledge

A dominant discourse of open access has contributed to an over-emphasis on content at the expense of context. This orientation has significant implications for the ways that educational activities can be perceived, and open education initiatives frequently appear to fetishize knowledge as a consumable object.

all the basic knowledge, all the refined physics, all the deep mathematics, everything of beauty in music, in the visual arts, all of literature, all of the video arts of the twentieth century can be given to everybody everywhere (Caswell *et al.*, 2008, p. 9–10).

Knowledge is portrayed here as a desirable object, immune to the influences of digitisation, interpretation or cultural understanding. The vast majority of OER initiatives are based in the UK and the US, far outweighing the scarce offerings from African, Asian or Latin American countries (POERUP, 2012), perhaps indicative of who is ‘giving’ such knowledge to the world. OERs are often popularised in the mainstream media as a solution to third world poverty (see Daniel & Killion, 2012). However, couching this technology in a discourse of economic benefit and emancipation merely serves to situate education in a role subservient to a functioning capitalist economy, and supposes the purpose of learning to be the increase of human capital (Atkins *et al.*, 2007). Daniel and Killion (2012) extend their notion of openness to include the interests of employers in determining the content of OERs in a move to boost employability. However, in foregrounding open access as the ultimate exercise of educational freedom, Daniel and Killion (2012) appear to mask the simultaneous surrender of content to the concerns of business. While openness is promoted as unrestricted access to information, the forces which determine what that information should be remain closed. This excessive attention to access reduces the desires of non-western peoples to an interest in retrieving content. Rather than simply making information available for consumption, Richter and

McPherson (2012) have called for improved educational justice through the ability to finitely adapt OERs to individual contexts and cultures. However, while this presents one way in which the OER movement could become more culturally sensitive, it surfaces underlying questions about the extent to which resources can be repurposed without diluting the goal of universal education.

While adaptability has been central to the OER movement, the recent upsurge of institutionalised MOOCs may be reversing this trend. In this context, “open” means free access to the educational content of a prestigious university, illustrated succinctly by the tagline on Coursera’s website: “Take the World’s Best Courses, Online, For Free” (2012c). Here students “take” educational content, rather than edit, remix, or contextualise it. The institutionalised MOOCs reinstate rigid and often idolised content, where hundreds of thousands of students are expected to consume identical curricula, predominantly through video lectures. While the technology provides elements of interactivity not always present in resource repositories, “openness” is framed almost exclusively in terms of access to predetermined content. The subject matter of these MOOC courses is necessarily non-negotiable; their reputation rests on the lofty prestige of the elite institutions that supply the content.

Conclusions: Open as “process”

To overemphasise the role of technology, as sections of this paper have done, may also provide an impoverished understanding of the complexities of open education. Therefore, rather than dismissing open access, the intention of this paper is to emphasise how these important developments might be enhanced when “openness” is perceived as a process.

Conole has suggested a movement away from stockpiling OER repositories (Conole, 2012). Work in this area has promoted online communities for the creation and sharing of OERs amongst teachers (Tosato & Bodi, 2011) and studied open practices amongst learners (Mwanza-Simwami, McAndre & Madiba, 2008). Such approaches have acknowledged the need to foster collaborative communities rather than focus on content. Okada, Mikroyannidis, Meister & Little (2012) propose strategies for involving social networks in the production and repurposing of OER, encouraging individual interpretations of content and the sharing of feedback. At the core of this strategy are processes of co-authorship and exchange (Okada & Leslie, 2012), rather than the consumption of authoritative information. Described as a “process of sensemaking, understanding and creating knowledge together” (Okada *et al.*, 2012, p. 17), this approach explicitly involves learners in the activities knowledge production. However, alongside these proposals for open educational practices, there are concerns about the lack of uptake and repurposing of OER (McAndrew *et al.*, 2009; Conole, 2012). While this may be related to the prevailing discourse of “access” highlighted previously, to perceive that open practices will provide a simple solution might be equally reductive. A focus on practice—the ways in which technologies are used—tends to overemphasise human agency. In calling for the technical processes of producing and repurposing OERs to be made more accessible, Okada *et al.* (2012) seem to maintain the dominant instrumentalist view. To foreground accessibility exaggerates the autonomy and intentionality of user(s), qualities which become abstracted from the affordances and limitations of the technology itself. It is therefore suggested that the open education movement may benefit from a more rigorous engagement with the philosophy of technology.

Dahlberg (2004) suggests that the field of Internet research has tended to assume one of three deterministic orientations regarding the influence of technology: “uses”, which privilege the ways that technology is used; “technological”, which foregrounds the qualities of the technology itself; and “social”, in which societal systems are emphasised. In relation to education, Kanuka has described these orientations as one-dimensional, suggesting that “little, if any, attention is given to the effects

of educational, social, and historical forces that have shaped both educational systems and educational technologies” (Kanuka, 2008, p. 101). Dahlberg (2004) calls for a non-reductionist approach, that “is sensitive to the complex interplay between multiple elements” acknowledging “that each so-called determining factor is itself embedded within and constituted by a system of inter-linked constitutive processes”. This offers one way in which the open education movement might further its agenda of “openness” by placing its own practices with, and perceptions of, technology under critical scrutiny. Rather than promoting “openness” as a transcendent societal ideal, or as an essential quality embedded within Internet technologies, research could begin to engage with the ways that individual agencies, social systems and technological production are deeply involved in each other. While OERs and MOOCs offer valuable and meaningful contributions to current practices in education, this work could be complemented with research which exposes the intertwined and contingent relationships between “openness”, technology and society. Thus, open processes might involve the exposition of social, economic, political and educational factors that have influenced the production of technology infrastructures, as well as the forms of open education that are subsequently made possible. It would also need to contend with the ways in which the networks, systems and software associated with OERs and MOOCs enable and constrain the activities of learning, ultimately shaping the educational and societal domains which have produced them.

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