The openness-creativity cycle in education - A Perspective

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Abstract: The nature of openness in education has transformed from just relating to open access to encompass a wide range of interpretations. This paper explores the concept of an 'open scholar' whose practice is shaped by digital and networked technologies. It is argued that openness represents an effective working method in this environment, and that creativity plays a key role in realising this. The relationship between creativity and open educational resources is outlined to demonstrate that there is a positive feedback loop between the two processes.

Keywords: Open education, open access, creativity, reciprocity, digital scholarship

The changing nature of openness

When the Open University (OU) in the UK was founded in 1969, its mission statement was to be 'Open to people, places, methods and ideas'. The emphasis in open education then was on open access - thus a model was developed which had no prerequisites to study and was based around a flexible distance learning model. In this manner many of those who were excluded from higher education could participate. As more universities have developed distance education models, part-time study, blended and online offerings, the question of access to higher education in the developed world is less of an issue than it was at the inception of the OU. In the UK the percentage of young people (18-22 year olds) attending university in 2008-2009 was 45%, compared with about 5% in the 1960s (with 51% of young women attending university) (Coughlan, 2010). In terms of access, the lifelong learning agenda and provision of flexible study has seen mature students (usually defined as those over the age of 25) now outnumbering traditional students in many countries (e.g. MacFadgen, 2008). The current financial crisis has seen a drop in admissions for the first time in over a decade, so open access may become an increasingly significant factor again. In many developing countries which are seeing a rapid expansion in higher education, open access is becoming an increasingly relevant issue. So,

open access may be less of an issue than it was, but it remains a central theme of openness in education. In this paper, it is the further dimensions of openness that will be the main focus.

Returning to the OU mission statement, it has survived remarkably well, but the examples we might call to mind for realising openness with regards to people, places, methods and ideas would now be different from those envisaged in 1969. Although open access is still a relevant issue for education, we have also seen a plethora of other interpretations and nuances on the term openness and how it relates to education over the past two decades in particular. This speaks to the evolving nature of the term and also the efficacy of 'openness' as an approach, be it in developing software or conducting research. Amongst the terms that are relevant to education are:

1. Open Source - much of the open source software movement had its foundations in higher education, and universities both develop and deploy open source solutions.
2. Open Educational Resources - the term OER was coined in 2002 to describe the application of open source principles to the release of educational content, initiated by MIT's Open Courseware project (http://ocw.mit.edu).
3. Open Courses - as well as releasing content as OERs a number of educators have begun exploring the concept of open courses, which are delivered online, with various models for payment (or entirely free).
4. Open Research - researchers are using a number of approaches to perform research practices in the open, including crowd-sourcing, open online conferences, open proposals etc.
5. Open Data - as well as sharing data openly (e.g. RealClimate.Org) there has also been a move to develop standards such as Linked Data, to connect and expose the vast quantities of data that are now available.
6. Open APIs - the recent web 2.0 approach saw an increase in the use of open Application Programme Interfaces (APIs). These allow other software developers to build tools and code that interrogates the data in one application. For example, both Facebook and Twitter have open APIs that facilitate the development of services which build on top of these existing tools.
7. Open Access Publishing - the ability to publish cheaply and quickly online has led to a movement around open access publishing, which is freely available and may use open peer review models.

Openness has almost become a cliché in education now, after all, few people will argue in favour of a 'closed' education. It is a term which is loosely applied, and having gained currency, much like the 'web 2.0' term is now one that is being appropriated in many different sectors. In the following section some of the features that characterise open education and how these relate to creativity are elucidated.

The open scholar

Open education can be realised in many ways - holding a public lecture or devising a mobile schools program could all be deemed to be open education. While such approaches are important, and in many contexts, appropriate, the current debates around open education are focused on the changes in practice that are afforded and influenced by two technological aspects:

1. It is based around digital content, where content can include debates, video, text, audio, forums, etc.
2. Resources are shared via a global network, both technical and social

The combination of digital content and a global, socially oriented distribution network has created the conditions in which new interpretations of open education can develop. Indeed, some commentators have begun to talk of the 'open scholar', which is almost synonymous with the 'digital scholar' so closely aligned are the new technologies and open approaches. For example, Gideon Burton (2009) makes the explicit link between openness and digital technologies:

> The traditional scholar, like the scholarship he or she produces, isn't open - open-minded, hopefully, but not "open" in a public way. No, a typical scholar is very exclusive, available only to students in specific academic programs or through toll-access scholarly publications that are essentially unavailable to all but the most privileged. In the digital age, the traditional barriers to accessing scholars or scholarship are unnecessary, but persist for institutional reasons.

There are two questions this link between new technologies and open education raises with respect to creativity. The first is, what are the mechanisms by which new technologies have facilitated openness? The second is, why is openness seen as a desirable and effective mode of operation in the digital networked environment?

Both of these questions are addressed below, but firstly it is worth delineating some of the characteristics of openness in education. Anderson (2009) suggests a number of activities that characterise the open scholar, including that they:

create;
use and contribute open educational resources;
self archive;
apply their research;
do open research;
filter and share with others;
support emerging open learning alternatives;
publish in open access journals;
comment openly on the works of others;
build networks

The significance of some of these may be open to debate, as is whether all are required to meet the definition of an open scholar, but of particular relevance is the presence of 'create' as the first item on the list. There is an implication that openness as an approach within a digital, networked context is a key component in realising creativity.

From a set of interviews conducted at the Open University with self-declared 'digital scholars' (Pearce, 2010), the following set of characteristics can be proposed, and suggest that an open scholar is likely to:

- Have a distributed online identity - using a variety of services an identity is distributed depending on the means by which the individual is encountered
- Have a central place for their identity - although their identity is distributed, there is usually one central hub, such as a blog, wiki, or aggregation service page (e.g. Flavors.me)

- Have cultivated an online network of peers - the open scholar usually engages in social networks through a preferred service (e.g. Twitter, Facebook, Friendfeed) and regularly contributes to that network
- Have developed a personal learning environment from a range of tools - not through a deliberate policy of constructing a PLE, but through personal trial and error, the open scholar develops a suite of preferred tools
- Engage with open publishing - when formal publications are produced the open scholar will seek an open publishing route for their dissemination
- Create a range of informal output - as well as producing traditional outputs, the open scholar produces and explores different forms of output such as video, podcast, slidecast, etc
- Try new technologies - there is an acceptance that technology is not fixed, and that new technologies are explored on an individual, ad hoc basis to ascertain where they fit into the individual's overall portfolio of tools.
- Mix personal and professional outputs - the social network space is characterised by the personal elements its participants reveal, which can be seen as the hooks through which connections are established. The open scholar deliberately mixes personal and professional observations in order to be an effective communicator within these networks, and does not seek to keep them distinct.
- Use new technologies to support teaching and research - when assessing or adopting new technologies they will be appraised not only for their use on a personal basis, but how they can be used to support professional practice, such as using social bookmarking for a research group or creating student portfolios in Friendfeed.
- Automatically create and share outputs - the default position of an open scholar is to share outputs, be they presentations, ideas, suggestions or publications using whatever route is appropriate.

Again, the presence of creativity is high in this list. While not every open scholar will adopt every one of these practices, they provide an archetypal set of characteristics which allow comparison with traditional scholarly practice, and also move away from some of the limitations of a straightforward classification of 'digital'.

Having suggested a range of characteristics for open scholars, the two questions set out above can now be addressed, which seek to explore the connection between digital technologies and the evolution of open education.

The facilitation of openness

The first issue relates to the mechanism(s) by which new technologies have facilitated openness. In the characteristics set out above, it is the last characteristic that is arguably the most significant - the default assumption, desire and ability, to share. This can be seen as the one action that has been fundamentally altered by the digital network.

This has occurred because successive technologies have built on existing networks, and the web 2.0 explosion in recent years in particular has seen a proliferation of free tools whose basic proposition is to distribute content across the network. While media sharing sites such as YouTube, Flickr and Slideshare are destination sites in their own right, much of their success has been built upon existing networks, particularly that of blogs and social media sites such as Facebook. The ease of sharing has been greatly increased by some data standards including RSS and embed codes which allow users to take content from one site and easily import it into another.

Leslie (2008) comments on the ease of this everyday sharing compared with the complexity inherent in many institutional approaches:

> *I have been asked to participate in many projects over the years that start once a bunch of departments, institutions or organizations notice that they have a lot in common with others and decide that it would be a good idea to collaborate, to share "best practices" or "data" or whatever...*

> *But inevitably, with a very few exceptions, these projects spend an enormous amount of time defining what is to be shared, figuring out how to share it, setting up the mechanisms to share it, and then…not really sharing much...*

> *Now I contrast that with the learning networks which I inhabit, and in which every single day I share my learning and have knowledge and learning shared back with me. I know it works.*

An illustrative example here can be taken from the music industry. To share music with friends used to be costly, in terms of time and resource. So to share music an individual might be required to purchase a tape, record all the songs (which would take at least the length of the tape and probably longer), and then they would give the tape away so would no longer own the resultant mix. Compare this with digital network versions of sharing and the use of services such as LastFM, which allow people to share music they have been listening to, and through data-mining, recommend similar music. Through tools such as Spotify and iTunes it is easy to share a playlist by simply making it public. Other tools such as Blip.fm allow easy sharing through social networks such as Twitter. In all of these cases the effort required to share is greatly reduced and is often a frictionless by-product of actions performed by the individual. In terms of both finance and time the cost of sharing has effectively disappeared.

This same ease of sharing applies in scholarly terms also. Three levels of this new, lightweight sharing can be categorised, showing increasing effort on the part of the sharer:

1. Frictionless - sharing that occurs without any additional effort required, for example if a scholar is gathering resources for their own research, then using a social bookmarking tool is an effective tool for them as well as making their list public.
2. Quick sharing - this requires a small level of effort, so does not occur simply as a by-product, but the effort required is minimal, such as sharing a link via Facebook, or uploading a PowerPoint presentation to Slideshare.
3. Content creation - this requires some effort to produce a digital artefact, for instance creating a blog post, a YouTube movie, or adding and synchronising audio to a presentation to create a 'slidecast'. The effort and expertise required is still relatively low compared to many traditional forms of output.

In addition there will be traditional artefacts, such as journal articles which can take a long time to produce, but can be easily shared online. There is an initial investment required in acquiring some expertise in using the tools necessary for effective sharing, but the technical ability threshold is low, it is rather a question of changes in practice. As Leslie's quote illustrates, some of the default attitudes towards sharing from both institutions and scholars is grounded in a model where the process of sharing was a logistical and categorisation issue.

The ease with which sharing can occur has inevitably led many scholars to adopt this practice as a means of dissemination, debate, teaching and research. However, being able to share easily is not the same as it being effective and worthwhile to do so. It is this aspect we will look at next.

The effectiveness of openness

This section will look at the second of the questions about openness, which is why has this mode of working been adopted, in varying degrees, across all aspects of education? Is it an inevitable consequence of the digital network or that previously difficult, but desirable models of working are now realisable?

One way of approaching this is to look at the citation levels of articles that are published online versus those that are in closed access journals. Hajjem, Harnad & Gingras (2005) compared 1,307,038 articles across a range of disciplines and found that open access articles have a higher citation impact of between 36%-172%.

So publishing in an online, open manner aids in the traditional measures of citation. In addition though there are a number of other benefits. For example, the crowd-sourcing approach to research allows researchers to gather input from a wide range of users. In 'Amazing Stories of Openness' Levine (2009) crowd-sourced contributions, and provides examples that include translations of resources, technical developments on an initial diagram, offers to give keynote talks, job offers, ideas for teaching, feedback on dissertations, etc.

The term 'lazyweb' refers to the practice of asking questions of one's network, rather than researching it yourself. This light-hearted term underplays a significant function of the social network, which is access to experts, peer and a wealth of experience which can be easily drawn upon.

Sharing, and thus openness is the base, the sine qua non, of an online social network, since if no-one shares then you cannot even begin to establish a network. And once it has started, the evidence is that it tends to multiply, so reciprocity becomes a consequence of the network. Therefore, in order to realise many of the benefits of a social network, openness is a pre-requisite, which means that it becomes an effective strategy for working.

OERs and creativity

Having established easy methods and tools for sharing, and a motivation, rooted in effectiveness, for openness, the conditions are now ripe for some (although by no means all) academics to start operating in this 'open scholar' fashion. In this section one aspect of how this influences behaviour is examined, namely the relationship between OERs and creativity.

Open educational resources started in earnest with the MIT Open Courseware (OCW) initiative (http://ocw.mit.edu/index.htm). This was started in 2001 through a grant from the Hewlett Foundation; with the aim of making all course materials available online.

OERs can be seen as a development on the previous work of learning objects (Wiley, 2001), which sought to develop reusable, shareable pieces of learning material. A number of projects were set up to generate learning objects, and to create repositories to house them, e.g. MERLOT.

Much of the focus on OERs has been around large-scale, externally funded OER projects such as MIT's Open Courseware and the Open University's OpenLearn projects. These have been successful in raising the profile of open education, creating a semi-politicised open movement and in generating impressive download figures of resources (e.g. Carson, 2005).

If one broadens the definition of OERs to encompass resources produced by individuals and shared on sites outside the formal education portals eg YouTube, Slideshare, Flickr, then a continuum of resources can be considered. These vary in granularity, quality and explicit learning intentions. This wider definition of OERs to include any open resource used in learning can broadly be characterised into two types of OER, namely 'big' and 'little' OER (from Hoyle, 2009). As with classification of science into big and little (Price, 1963) the distinction is not perfect, but it addresses two fundamentally different approaches, which can be seen as complementary. For OERs the differences can be summarised as:

- Big OERs are institutionally generated ones that arise from projects such as Open Courseware and OpenLearn. These are usually of high quality, contain explicit teaching aims, are presented in a uniform style and form part of a time-limited, focused project with portal and associated research and data.
- Little OERs are individually produced, low cost resources. They are produced by anyone, not just educators, may not have explicit educational aims, have low production quality and are shared through a range of third party sites and services.

Using this simple granularity classification, some of the issues around OERs and creativity can be explored.

The type of creativity applied will vary for both types of OER. For example, the experience of the OpenLearn project has been that very few units are changed or adapted for use. The OpenLearn research (McAndrew et al, 2009) report states

> *In relation to repurposing, initially it was thought:*
>
> *1. that it was not anyone's current role to remix and reuse;*
>
> *2. the content provided on the site was of high quality and so discouraged alteration;*
>
> *3. there were few examples showing the method and value of remixing;*
>
> *4. the use of unfamiliar formats (such as XML) meant that users were uncertain how to proceed.*

Creativity in the use of Big OER is then realised through the creative application of existing content within a learning design. The focus of creativity shifts from the production of content to the provision of the structure and guidance within which that content is located.

This is markedly different with Little OER, which are produced by the individual. Creativity in Little OER is therefore focused on the production, but also on their aggregation. With Little OER their use is often unpredictable, precisely because they are of a smaller granularity and do not have the same level of intentionality associated with them. An example might be an image shared on Flickr, which depicts, say a collection of toys, and is used in a presentation as a

representation of diversity within a community. The resource may not be adapted, but it is used in an unintended and unpredicted context. This is an example of what Zittrain (2008) terms 'generativity' which he defines as 'a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences'. Little OERs are high in generativity because they can easily be used in different contexts, whereas the context is embedded within Big OERs, which in turn means they are better at meeting a specific learning aim.

What this indicates is that the relationship between creativity and OERs is not limited to the production of the content itself, but also the context within which the OERs exist. The importance of educational context was one outcome in a project where academics used Flip cameras and other tools to start producing multi-media content (Weller, 2010). They uploaded their content to YouTube and to a wiki. As one of the contributors commented:

> *No amount of creativity in the making of an artefact will compensate for the absence of a framework within which to disseminate it. My Facebook postings (of links to my 2 videos) received brief comments from 3 of my 67 'friends'. Nothing on Twitter or Youtube. This de-motivated me to continue investing the time. If I'd had, say, a teaching forum with students working on intercultural semiotics, I'd have had more of an impact.*

As was suggested above, little OER encourages aggregation and through this, the creation of context. While this offers greater flexibility, it also requires greater effort, whereas the educational context of big OERs is inherent in both their location and their content.

As McAndrew et al found, individual users don't tend to adapt OERs (which in this case refers to big OER). The reasons for this are varied, including technical complexity and motivation. One other reason which the OpenLearn team suggest is that the 'content provided on the site was of high quality and so discouraged alteration'. This is an interesting observation as it seems to indicate that high quality content encourages a somewhat passive acceptance, and maybe discourages creativity in the adopters of that content. In this sense big OER may be seen to be akin to broadcast content. The OpenLearn team also reported that social interaction was not a high priority for most users: 'a large choice of content is considered the most important feature of OpenLearn and that interacting with other learners is low on this list' (although there was an active subset of users who were identified as social learners and made extensive use of forums).

In contrast the low production quality of little OERs has the effect of encouraging further participation. The implicit message in these OERs is that the consumer can become a producer - they are an invitation to participate precisely because of their low quality. Whether this is in writing a blog post that links to it, or in creating a video reaction, the low threshold to content creation is a feature of little OER. Not all users of a site will become creators, YouTube claim that '52 percent of 18-34 year-olds share videos often with friends and colleagues' (http://www.youtube.com/t/press_statistics) whereas the majority of Wikipedia edits are performed by a small group of users (Ortega, 2009).

In educational terms it may be that both have a role to play within a learning context, or course. Learners may want to feel the reassurance of the quality brand material for core content, but also want a mixture of the more social, participatory media that encourages them to contribute as well.

The openness-creativity cycle

In this paper the nature of openness in education and its relation to creativity has been explored. Creativity can be seen as a product of openness, in that the liberation of forms of expression and low threshold to production encourages

innovation and experimentation. It can also be viewed as a prerequisite for open education, since the sort of default sharing activity that has been stressed as essential for openness to flourish is essentially an act of creativity. The sharer produces something (ranging from a simple tweet to a multi-media artefact) and then shares this through a variety of peer networks. OERs and other forms of open content all rely on a sufficient critical mass of content in order to be viable, and this abundance of content only arises if there is sufficient creativity expressed by a wide range of producers.

There is thus an intricate relationship between creativity and openness, both feeding each other. This is discussed by Chris Anderson (2010) who explores the idea of rapid innovation being driven by the sharing of video on a global scale. He gives the example of dancers sharing moves via YouTube, which they then learn, and innovate upon, then share back. He refers to this phenomenon as 'crowd accelerated innovation', which requires three elements to flourish: a crowd, where people will occupy a number of roles; light, which can be interpreted as the ability to be able to see what people, particularly the innovators are doing; and desire, which is the motivation to spend the required time in attempting innovation, and is driven often by competition and the potential to be seen by a large audience. In this interpretation creativity is driven by openness, because people are learning from each other's shared efforts, and openness is enhanced by creativity, as the performers seek to compete with each other and share with a global audience.

This creativity-openness feedback cycle is not only present for visual skills such as skateboarding, graffiti and dancing, but has a scholarly version also. As academics share presentations on sites such as Slideshare for example they both gain a wider audience, but also improve their own presentation style and content. As researchers share ideas via blogs and social networks they get access to earlier feedback, and are also required to justify their work, while also finding innovative ways of communicating, and so on. The open approach drives creativity, which begets further openness. Understanding this relationship and how it can enhance teaching and all aspects of scholarship will be a key skill for open scholars.

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