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8 A Pedagogy of Abundance

When we consider the changes in scholarly practice, it is perhaps in teaching that we see the greatest potential for a radically different approach to emerge. The three key elements of digital, networked and open converge most significantly around the production, pedagogy and delivery of education. In this chapter I will examine some of the implications, focusing on the shift to abundant content as one pertinent issue. As with the preceding chapters, this is intended as one perspective that illustrates the impact of the digital, networked, open approach and not as the only issue of relevance.

Economics of abundance and scarcity

One perspective of relevance to teaching and learning is the effect that sudden, and great, abundance of learning content and resources has on how educators approach learning. There is an obvious relation to economics here. Traditional economics can be viewed as a study of the impact of scarcity. In his 1932 essay Robbins defined economics as ‘the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses’.

But when goods become digital and available online then scarcity disappears. They are non-rivalrous so that if a copy is taken, it is still available for others. They are distributed free on a global scale (if we ignore infrastructure costs which apply to all content). When analysing the lessons from other industries in Chapter 3 the problems industries have faced can be viewed as essentially making a transition from an economics of scarcity to an economics of abundance. If the music industry is considered from this perspective then the traditional model can be said to have been based around the following assumptions:

- talent is scarce
- locating it is difficult
- content is physical
- content is manufactured according to demand
- access to it is scarce

What follows from this set of assumptions is the structure of the entire industry. Talent is discovered by Artists and Repertoire (A & R) agents, who spend their time attending concerts, building networks and talking with bands to find new talent. Once discovered artists are signed exclusively to a label, who then record their content and produce this in a physical format. This is then distributed via a logistics network to a chain of shops. With limited opening hours, the consumer could then go to the shop to purchase the item, if it was in stock, or order it if not, because storage space would be limited. After a period, depending on popularity, the item would cease to be produced and become available only via second-hand record shops.

This model seems antiquated already, and yet it is one of recent history. The first 'attack' it suffered was that of online ordering, through the likes of Amazon. The small storage space of the local record shop was no longer a limiting factor, and entire back catalogues were available at the click of a mouse. The necessity of travelling to the shop was removed, and although there was no restriction on when you ordered, there was still a delay in receiving the physical goods.

The changes brought by the advent of online shopping were significant, but essentially it was the same model for the music industry but with an improved shop front. The structural change to the industry arose when the format of music changed to the digital file, which could be freely distributed online. In this model talent is still scarce, but the act of locating it has changed. The artists can promote themselves; listeners locate music through the routes we saw in Chapter 3 (such as LastFM and playlists) without the intervention of a record label. For the consumer the availability of music is instant, the granularity alters, and if the individual uses bit-torrent-type downloads then entire back catalogues are as easily downloaded as one track. This changes the consumers' relationship to content; their own time and attention become the key scarce resources now.

Responses to the digital era can be classified as 'abundance' and 'scarcity' responses. The former takes the assumption of new abundance and tries to work it to their advantage. The Freemium model is one such example, as realised by Flickr, for example. Here users get a good level of service free, to attract sufficient numbers. The additional value that requires payment only attracts a small percentage of users (estimates vary between 5 and 10 per cent of Flickr users who convert to 'Pro' customers), but with a large base it becomes significant. As Chris Anderson (2008) puts it,

Freemium as the opposite of the traditional free sample: instead of giving away 1% of your product to sell 99%, you give away 99% of your product to sell 1%. The reason this makes sense is that for digital products, where the

marginal cost is close to zero, the 99% cost you little and allow you to reach a huge market. So the 1% you convert, is 1% of a big number.

Chris Anderson also coined the term 'long tail', which was examined in Chapter 7, and this too can be viewed as an 'abundance response'. The long tail argues that with an abundant stock range, businesses make money not by selling large quantities of a few items (the blockbusters) but by selling small quantities of a large number of items.

Other models include giving away the digital object free, and where one exists, charging for the physical object. This is a model being explored by publishers such as Bloomsbury Academic. Where no physical object exists, then it is associated services which attract a cost; for example, while many users download and install open software solutions freely, a small number are willing to pay for consultancy services around these. The most widely deployed abundance response is to use advertising revenue to allow free access to content. It still remains to be seen how successful many of these approaches will be; these are after all, transitory times.

Scarcity responses, however, seek to re-establish, or retain, the existing economic model by introducing scarcity into the digital content. An obvious example is that of digital rights management (DRM), which attempts to encode legislation and usage within the content itself. For example, iTunes limits the number of computers that you can have accounts on and restricts the devices you can associate with an iTunes account. DRM is often backed up with strong legal enforcement, where we have seen recent examples of the founders of torrent sharing site Pirate Bay being fined 30 million Swedish kronor and receiving a jail sentence for encouraging illegal file sharing. In the United Kingdom, the Digital Economy Act was passed in 2010, which will identify copyright infringements and then require the user's internet service provider to issue a notice. In many of the arguments put forward for such approaches analogies are made to rivalrous, scarce goods or services; for example, Paul McCartney, commenting on the Pirate Bay case, said 'if you get on a bus, you've got to pay. And I think it's fair, you should pay for your ticket'. Paywalls and subscription models can also be seen as an attempt to re-establish the scarcity of content.

Education and abundance

If we use this perspective to examine education we can consider how education may shift as a result of abundance. Traditionally in education expertise is analogous to talent in the music industry – it is the core element of scarcity in the model. In any one subject there are relatively few experts (compared with the level of knowledge

in the general population). Learners represent the 'demand' in this model, so when access to the experts is via physical interaction, for example, by means of a lecture, then the model of supply and demand necessitates that the learners come to the place where the experts are located. It also makes sense to group these experts together, around other costly resources such as books and laboratories. The modern university is in this sense a solution to the economics of scarcity.

The production of books and journals can be seen as an initial weakening of this model, as it separated some level of expertise from the individual. However, access was still limited to physical artefacts, and the prohibitive costs of many of these meant that the only way to access them was through libraries, reinforcing the centralised physical campus model.

As a result, a 'pedagogy of scarcity' developed, which is based around a one-to-many model to make the best use of the scarce resource (the expert). This is embodied in the lecture, which despite its detractors is still a very efficient means of conveying certain types of learning content. An instructivist pedagogy then can be seen as a direct consequence of the demands of scarcity.

While expertise is still rare, the access to content associated with it is now on a different scale. We have (often free) access to journal articles, videos, podcasts, slidecasts and blog posts. And it is not only content we can access but also discussion through forums, comments and blogs. In addition there is access to your own or other's social networks. The experts themselves may be more approachable, or there may be discussion around their content in dedicated forums. People may have shared annotated versions of their work or associated reading lists through social bookmarking. This scale and range of learning-related content at least raises the question of whether we have developed the appropriate teaching and learning approaches to make best use of it. In short, what would a pedagogy of abundance look like?

The advent of elearning has seen an exploration of new pedagogies or at least a shift in emphasis onto different ones. Siemens (2008) argues that '[l]earning theories, such as constructivism, social constructivism, and more recently, connectivism, form the theoretical shift from instructor or institution controlled teaching to one of greater control by the learner'. In examining the current physical space of a lecture hall, Wesch (2008) asked students what it 'said' about learning, in essence what were the affordances of the physical learning environment. His students listed the following:

- 1 to learn is to acquire information;
- 2 information is scarce and hard to find;

- 3 trust authority for good information;
- 4 authorised information is beyond discussion;
- 5 obey the authority; and
- 6 follow along.

These are obviously at odds with what most educators regard as key components in learning, such as dialogue, reflection, critical analysis and so on. They are also at distinct odds with the type of experience students have in the online world they inhabit regularly, particularly the social network, read/write web. These environments are characterised by

- user-generated content
- power of the crowd
- data access
- architecture of participation
- network effects
- openness

It may be that we do not require new pedagogies to accommodate these assumptions as Conole (2008) points out:

Recent thinking in learning theory has shifted to emphasise the benefit of social and situated learning as opposed to behaviourist, outcomes-based, individual learning. What is striking is that a mapping to the technologies shows that recent trends in the use of technologies, the shift from Web 1.0 to Web 2.0 echoes this; Web 2.0 tools very much emphasise the collective and the network.

But she goes on to say that

Arguably then there has never been a better alignment of current thinking in terms of good pedagogy – i.e. emphasising the social and situated nature of learning, rather than a focus on knowledge recall with current practices in the use of technologies – i.e. user-generated content, user-added value and aggregated network effects. Despite this, the impact of Web 2.0 on education has been less dramatic than its impact on other spheres of society – use for social purposes, supporting niche communities, collective political action, amateur journalism and social commentary. (Conole 2008)

In examining the changes that education needs to accommodate to be relevant to the digital society, Seely-Brown and Adler (2008) emphasise the shift to participation, arguing that in order to meet the growing demand for education, and the requirements of a rapidly changing workplace, the traditional model of supply-push needs to be replaced with one of demand-pull. Learners need to be able to learn throughout their lives and to be able to learn about very niche subjects (Anderson's long tail again). The only way to accommodate these needs they argue is to move to a more participatory, socially constructed view of knowledge. They stress the significance of new technologies in realising this:

Tools such as blogs, wikis, social networks, tagging systems, mashups, and content-sharing sites are examples of a new user-centric information infrastructure that emphasizes participation (e.g., creating, re-mixing) over presentation, that encourages focused conversation and short briefs (often written in a less technical, public vernacular) rather than traditional publication, and that facilitates innovative explorations, experimentations, and purposeful tinkering that often form the basis of a situated understanding emerging from action, not passivity.

Any pedagogy of abundance would then, I suggest, be based on the following assumptions:

- Content is free – not all content is free, but increasingly a free version can be located and so an assumption that this will be the default is more likely than one based on paywalls or micropayments.
- Content is abundant – as covered above, the quantity of content is now abundant as a result of easy publishing formats and digitisation projects.
- Content is varied – content is no longer predominantly text based.
- Sharing is easy – as I have suggested in Chapter 7, there are now easy ways to share, so the 'cost' of sharing has largely disappeared.
- Social based – this may not necessarily entail intensive interaction; filtering and sharing as a by-product of individual actions constitutes a social approach to learning.
- Connections are 'light' – as with sharing, it is easy to make and preserve connections within a network since they do not necessitate one-to-one maintenance.
- Organisation is cheap – Clay Shirky (2008b) argues that the 'cost' of organising people has collapsed, which makes informal groupings more

likely to occur and often more successful: 'By making it easier for groups to self-assemble and for individuals to contribute to group effort without requiring formal management, these tools have radically altered the old limits on the size, sophistication, and scope of unsupervised effort'.

- Based on a generative system – Zittrain (2008) argues that unpredictability and freedom are essential characteristics of the Internet and the reason why it has generated so many innovative developments. Any pedagogy would seek to harness some element of this generative capability.
- User-generated content – related to the above, the ease of content generation will see not only a greater variety of formats for content but courses being updated and constructed from learner's own content.

Possible pedagogies

As Conole suggested, there are a number of pedagogies which meet some of these assumptions. In this section some of the contenders for a pedagogy of abundance are examined.

Resource-based learning (RBL)

This places resources in the foreground of learning, and the learner's interaction and selection of these (which may include human resources) is the driving principle. Ryan (2000) uses the following definition for RBL, taken from the Australian National Council on Open and Distance Education. RBL is 'an integrated set of strategies to promote student centred learning in a mass education context, through a combination of specially designed learning resources and interactive media and technologies'. If one views the abundance of resources as the primary factor in a pedagogy of abundance then RBL looks like an appropriate strategy. I would suggest that it is often still grounded in a scarcity approach, however; for example, Ryan goes on to argue that 'these integrated strategies for RBL should be based on the application of a range of instructional design principles to the development of learning materials'. In a world of abundance the emphasis is less on the development of specific learning materials than on the selection, aggregation and interpretation of existing materials.

Problem-based learning (PBL)

Barrows and Tamblyn (1980) summarise PBL as 'the learning that results from the process of working toward the understanding or resolution of a problem. The problem is encountered *first* in the learning process'. In PBL students are given an

ill-structured or open-ended problem. They work often in small collaborative groups towards a solution, but often there is no definite answer. The role of the teacher is one of facilitator, helping groups if they get stuck, providing useful resources and advice. In medical education in particular, PBL has been well researched and there has been some modest evidence that it is more effective than traditional methods (Vernon and Blake 1993; Smits, Verbeek and de Buissonjé 2002), so it has a solid grounding. With its emphasis on learner direction, use of diverse resources and open-endedness it meets many of the requirements set out above. As with RBL it may need recasting to fully utilise the new found abundance of content, where there is greater stress on finding and evaluating wide range of resources, and the utilisation of social networks as a resource.

Constructivism

This theory of learning gained much popularity in the 1990s, particularly with the advent of elearning. It is a view of learning that places the focus on individual learners who constructs their own knowledge through activity. Jonassen (1991) describes it thus:

Constructivism ... claims that reality is constructed by the knower based upon mental activity. Humans are perceivers and interpreters who construct their own reality through engaging in those mental activities ... What the mind produces are mental models that explain to the knower what he or she has perceived ... We all conceive of the external reality somewhat differently, based on our unique set of experiences with the world.

In practice this has been realised as courses which often have a strong group, discursive and reflective component, with the emphasis on individuals to develop their own interpretations, with the educator in less of a teacher role and acting more as a facilitator. Given that it has a loose definition, it is hard to pin down a constructivist approach exactly. Mayer (2004) suggests that such discovery-based approaches are less effective than guided ones, arguing that the 'debate about discovery has been replayed many times in education but each time, the evidence has favoured a guided approach to learning'. It could be argued that with everyone able to publish content in a Web 2.0 world, the 'dangers' inherent in constructivism become more pronounced, as the proliferation of conspiracy theories might attest. However, given that this is the environment everyone has to operate within, the ability to construct appropriate and rigorous knowledge from a range of sources is even more relevant. When Kirschner, Sweller and Clark (2006) claim, with some justification, that 'the epistemology of a discipline should not be confused with a pedagogy for teaching/learning it' that only highlights that the epistemology of a

discipline is now being constructed by all, so learning how to participate in this is as significant as learning the subject matter of the discipline itself.

Communities of practice

Lave and Wenger's (1991) book on situated learning and Wenger's (1998) influential book on communities of practice highlighted the social role in learning and the importance of apprenticeship. They proposed the concept of 'legitimate peripheral participation', whereby participants move from the periphery in a community to its core by engaging in legitimate tasks. A very practical example of this is seen in open source communities, where participants move from reading and occasionally commenting in forums to suggesting code fixes and taking on a range of functions such as moderation and code commenting. Crowston and Howison (2005) propose a hierarchical structure for FLOSS communities, consisting of the following layers:

- 1 At the centre are core developers, who contribute the majority of the code and oversee the overall project.
- 2 In the next layer are the co-developers who submit patches, which are reviewed and checked in by core developers.
- 3 Further out are the active users who do not contribute code but provide use-cases and bug-reports as well as testing new releases.
- 4 Further out still are the many passive users of the software who do not contribute directly to the main forums.

Bacon and Dillon (2006) suggest that some of the practices seen in open source communities can be adopted by higher education, in particular, the process of peer-production and the situated method of teaching and learning. With its practical approach, self-direction, user-generated content and social aspect, the communities of practice approach as realised in open source provides an interesting model, since it devolves much of the work to a community, from which all benefit. However, the number of successful open source communities is relatively small compared with the number of unsuccessful ones, and thus the rather tenuous success factors for generating and sustaining an effective community may prove to be a barrier across all subject areas. Where they thrive, however, it offers a significant model which higher education can learn much from in terms of motivation and retention (Meiszner 2010).

Connectivism

This is a learning theory proposed by George Siemens (2005). Of the theories listed here it is the only post-network theory, which has as its starting assumption the

Internet and the mass of connections we establish. As Siemens states, 'Learners as little as forty years ago would complete the required schooling and enter a career that would often last a lifetime. Information development was slow. The life of knowledge was measured in decades. Today, these foundational principles have been altered. Knowledge is growing exponentially'. Connectivism then stresses that learning takes place within a network. The following are the principles of connectivism:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialised nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Connectivism can be seen as an approach to learning that foregrounds the significance of the network and connections. Using its principles Downes and Siemens have run large-scale open online courses. Given its starting assumption it is probably closest to a pedagogy of abundance, but it is still relatively new and, while it sets out some clear principles and draws on other theories, it is not yet fully formed as a pedagogic theory.

Conclusion

The intention here was not to set out a how-to guide for teaching or even to evaluate the effectiveness of these theories. We are witnessing a fundamental change in the production of knowledge and our relationship to content. This is producing an abundance of content which is unprecedented. Google CEO Eric Schmidt claims that society produces more information in two days than was created from the beginning of human history until 2003, stating 'the real issue is user-generated

content' (Siegler 2010). Many of our approaches to teaching and learning were developed in a different age, and this basic shift from moderate scarcity to excessive abundance constitutes a challenge to higher education and to individual information processing abilities. It may well be that the existing theories are sufficient; they just need recasting or reimagining for a world of abundance. Bill Kerr (2007), for example, argues that 'the new territory which George Siemens connectivism and Stephen Downes connective knowledge seeks to claim has either already been claimed by others or has been better done by others'.

Abundance does not apply to all aspects of learning; indeed the opposite may be true, for example, an individual's attention is not abundant and is time limited. The abundance of content puts increasing pressure on this scarce resource, and so finding effective ways of dealing with this may be the key element in any pedagogy. However, I would contend that the abundance of content and connections is as fundamental shift in education as any we are likely to encounter, and there has, to date, been little attempt to really place this at the centre of a model of teaching.