Journal of Learning for Development – JL4D

ISSN: 2311-1550

Vol. 3, No. 2, pp. 26-34

The Open Flip – A Digital Economic Model for Education

Martin Weller

Institute of Educational Technology, The Open University, Milton Keynes, UK

Abstract: The advent of the internet and digital technologies has given rise to a number of new economic models. These have often been applied to education, but either through faults in the initial models or differences in the characteristics of the education sector, they have not proven to be widely applicable. The use of digital, network technologies combined with open licences is one area that has seen particular success in educational application. This field offers an economic model that has particular application to education, through the reallocation of finances to the production of openly licensed resources instead of the purchase of copyrighted ones. This has potential significant impact across a range of educational practices and beyond.

Keywords: Open education, Digital economy, Open educational resources, Massive open online courses

Models of the Digital Economy

The digital, networked revolution has seen a number of different economic models proposed that seek to deal with new opportunities and reality. The new issues that digital economic models need to incorporate include a shift from scarcity to abundance, the non-rivalrous nature of digital goods, distributed creation, different sets of values, a shift in what consumers will pay for, instant delivery and access, and social media and online communities as distribution channels. This creates a very different context for many industries than one based around the creation, distribution and marketing of scarce physical goods.

Anderson (2007) highlighted the Long Tail underlying many online businesses, which the internet made more viable. In this model a business, such as Amazon, generates a significant amount of its turnover by selling small quantities of a wide distribution of goods, not relying solely on 'blockbusters'. Anderson (2009) also proposed that many online businesses move to a freemium model, whereby some content is given away for free, but other, premium services are paid for. Castells (1996) sees networks as the most significant unit in society, and by extension, in economics. How the network deals with information flows is key to understanding economic models. Benkler (2006) extends this model by looking at the economics of social production. He stresses the non-rivalrous nature of digital goods (i.e., they can be copied perfectly without any reduction to the original) and the distributed nature of production in peer communities. In such a model he suggests that 'human capacity becomes [a] primary scarce resource'.

The open source software community can be seen as an example of this initial phase of digital economics. In open source the source code of software is made accessible to anyone under licences that specifically allow modification and reuse. Open source software can be limited to a single or small set of developers, or be the product of a large community. While it is not the only way to

produce software, and works alongside more proprietary approaches, the open source approach has proven itself to be viable. This is because the distributed model is an effective model for producing high quality software, the mantra of Raymond (1999) captures it in 'given enough eyeballs, all bugs are shallow'. The peer production model is well established, with participants undertaking different tasks such as writing code, debugging, testing, and integrating software, as well as broader services such as suggestions for product features, distribution, answering queries, and helping new members having problems with the software, etc. (Meiszner, Glott & Sowe 2008) This model demonstrates how openly licensed resources can be produced by distributed communities, along the lines suggested by Benkler and Castells. This can be seen as a first wave of digital economics, and remains successful in many areas.

However, the model of interest-driven, peer community production is not always applicable to more financially motivated markets. The learning object movement can be seen as an example of an attempt to apply this open source model to higher education. Learning objects are reusable digital artefacts, and there was considerable interest in a community driven approach and a learning object economy in the late 1990s and early 2000s, e.g., Larsen & Vincent-Lancrin (2005). However people were soon querying why the promise of learning objects had not been realised, for example Campbell (2003) stated, 'For some time now there has been a growing awareness that even the most accessible resources have failed to be widely adopted by the educational community and as a result have also failed to fulfil their considerable educational potential.' Similarly, Gunn, Woodgate, & O'Grady (2005) noted that, 'Uptake of these resources is happening at a slower than desirable pace, despite the unquestionable quality of design and production, high levels of investment in professional development and the rationally anticipated outcome of this investment'. The community driven, open source model had failed to transfer successfully to education, and focus instead shifted to open education resources (OER). Downes (2007) proposed several models for sustainability including endowment, membership, institution and government funding models for OER. The model proposed here can be seen as revisiting some of these in light of recent practice.

Christensen's (1997) theory of disruption has gained a lot of interest in digital economics. Christensen differentiated between sustaining and disruptive technologies, arguing that the former improve existing products, while the latter create new markets. Many companies, he claimed, focus on sustaining technology because that is what they know about and hear from the customers. New entrants to a market will often develop the disruptive technology, which although often inferior initially, eventually replaces the existing model, usually due to the extinction of the older companies and technology. The digital camera, personal computer and smart phones are all prime examples.

A related concept is that of unbundling, proposed by, amongst others, Evans and Wurster (2000). Unbundling occurs when a business can be seen as being composed of many different separate products and services. In an analogue world these are grouped together for convenience. But when services move online they become unbundled because transaction costs are significantly reduced and those services can be obtained from a range of different providers by the consumer. An example given by Evans and Wurster is car sales in a pre-internet age, which used to combine used and new car sales, car financing, servicing and repairs. Now each of those elements can be sourced online and the initial 'glue' that held them together is weakened.

Both unbundling and disruption have been applied to education by numerous observers. For example Craig (2015) links the pressure created by the rising cost of higher education and the free offerings of MOOCs to argue that the different components of an education offering could be supplied by companies. Christensen, Horn & Johnson (2008) have suggested that education is primed for disruption through technology, stating that 'disruption is a necessary and overdue chapter in our public schools.' A report into higher education (Barber, Donnelly, & Rizv: 2013) claimed that all the key 'elements of the traditional university are threatened by the coming avalanche. In Clayton Christensen's terms, universities are ripe for disruption.'

These concepts have often been over-applied and have shown themselves to be less than robust. Lepore (2014) examined Christensen's case studies of disruption in detail, and found the methodology fundamentally flawed, and the model lacking in any predictive power. Dvorak (2004) complains that disruption is essentially meaningless, stating that, 'There is no such thing as a disruptive technology. There are inventions and new ideas, many of which fail while others succeed. That's it.' Similarly unbundling is often touted, but the glue that holds services together proves to be stronger than anticipated.

More recently new businesses driven in part by the proliferation of smart phones and apps, have been grouped under the heading of 'the sharing economy'. Uber and AirBnB are the most commonly cited examples for this model. Hamari *et al* (2015) define the sharing economy as, 'The peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services)'. For AirBnB this is realised through people letting out a room in their house, and for Uber drivers it entails operating as a taxi driver in their spare time. What underlies these businesses is a reduction in transaction costs (it is easy to register and operate as an Uber driver or AirBnB host) and effective use of the network to find services, rate providers, and compete on price.

The sharing economy has quickly shifted to professional providers, e.g., full time Uber drivers, rather than a model that made use of existing resources. There is also concern about the manner in which such models undermine employee rights, and the global monopolisation of services by a few providers.

With all of these models there is a tendency to over-apply them to all sectors. For example, the freemium model was widely praised at the time, but few businesses have managed to make it successful, and even the often quoted example of Flickr is in difficulty. Similarly there have been a number of examples of the Uber model applied to different sectors. Inevitably education is one of these, for example Nassim Taleb (2015) argues that learners will bypass institutions and go direct to instructors; Rogers (2014) excitedly claims that a start-up, InstaEDU, will transform education; and Burke (2015) revisits the idea of unbundling education with Uber as an analogy.

A common theme for such economic models applied to education is that universities will be made redundant because individual learners will go direct to a marketplace of private educators. However, in the desire to seek new markets for a successful model, it is rarely considered how that sector differs from the existing model. Taking Uber as an example, the key points of the successful Uber offering can be summarised as:

- A taxi ride is a brief interaction. It may be pleasurable to have a conversation with the driver, but it is a short interaction, with relatively little social investment.
- A taxi ride may vary in some local colour in terms of car, environment, etc. but it is essentially the same product every day and anywhere in the world.
- It is something that a lot of people possess the equipment for (a car) and the capability (driving).
- The customer has a clear understanding of what they wish to attain from the transaction, e.g., to get to their destination safely and at low cost.
- It is largely a solitary pursuit.
- It utilises mobile technology and pervasive connectivity to overcome some of the limitations of the previous model, that of locating a cab, or booking via the phone.

In comparison, very few of these conditions apply to education, which has the following characteristics:

- It requires a long time frame, certainly longer than a typical taxi ride, to gain the required outcome.
- It is very diverse, both geographically and by discipline, so any model would need to accommodate such diversity and thus be difficult to use, compared with the simplicity of Uber
- While there are a lot of people who can act as tutors, the ability to construct a curriculum or design a learning activity that can be effectively delivered online is quite rare. Also while gaining a driving licence is fairly easy, being licensed to offer formal credit for learning is very difficult.
- Meno's paradox stresses that if a learner knows what they're looking for, inquiry is unnecessary. If they don't know what they're looking for, inquiry is impossible. A learner in a new discipline, therefore, is often in the position of not knowing what it is they need to know. It is more problematic in education then to bypass institutions and processes that are constructed to help overcome this very problem.
- Learning is often a social activity that is undertaken with a cohort of people with similar interests and goals.
- Education is already engaging with online learning and mobile delivery, so the problem that an Uber for education is solving is less immediately obvious.

There will be aspects of what might be termed the Uberization of education and many are already in place, and are just part of the changing approach to workforce. For instance, it is often difficult for an institution to compete with an individual consultant on price for research that doesn't require large resources. For example writing a review or conducting interviews, often has prohibitive overheads for a university compared to a private researcher working out of a home office. Similarly the online tutoring model is already underway with many part time online tutors employed by universities.

Models of the digital economy then have had varying degrees of success, and while they are often applied to education, they have not caused a significant shift in practice. This is partly a result of flaws in the theories themselves, for instance that disruption is largely a rhetoric tool, but also because the

models are often focused on consumer behaviour. While students are often referred to as consumers, and with rising student fees in many countries, they perceive themselves this way to an extent (Cuthbert 2010), higher education is not a straightforward consumer model, as the comparison with Uber illustrates. What this paper sets out is a digital economy model that is focused not at the consumer level, but directed at large scale investment, and as such suits many of the characteristics of education, which operates at scale.

The Open Flip

This model originates similarly with the new demands of digital, networked society but also builds on the Benkler work on open licences. Open licences, typically those of Creative Commons, allow for the reuse and adaptation of content, while protecting the originator's right to be acknowledged (and possibly further restrictions depending on the particular licence). The intersection of these three elements has led to significant movements in education around openness. Notably the mainstream adoption of open access models in publishing, the release of open education resources (OERs), and more recently large scale open courses, known as MOOCs (massive open online courses). Weller (2014) argues that to an extent openness has 'won' as an approach, in that it has been accepted as a viable model of operation in higher education.

Arising from these movements, which are centred around content production, is a new model of allocating resources, which can be termed the 'open flip'. Briefly stated, the open flip is a reallocation of finances away from purchasing copyrighted resources to the production of openly licensed ones.

One example of the open flip in operation is the open textbook movement in North America. The price of textbooks has become an increasing issue for North American students, with the average cost per student in excess of $900 (Hilton III *et al* 2014). This has caused the OER movement in the United States to focus on creating openly licensed textbooks. Projects such as OpenStax, the Open Textbook Library, BC Campus (in Canada), and Lumen Learning are all developing or promoting open textbooks. The findings from these projects has been positive, with research demonstrating the efficacy and quality of such textbooks is as good if not better than existing ones (Fisher *et al* 2015). In terms of savings to students, it is difficult to quantify as usage is not always reported and is thus difficult to track and, additionally, estimates can assume all students who downloaded a book would have purchased a new one or may have opted for cheaper versions, loaned ones or decided the textbook was not essential. Both OpenStax and BCCampus attempt to accommodate some of this variation by using the average figure of $100 per textbook per student. With this value OpenStax estimates it has saved students $66 million in book purchases (https://openstax.org/impact) and BCCampus $1.5 million (https://open.bccampus.ca/open-textbook-stats/). Just a single college (De Anza College) estimated savings of $1 million based on previous purchasing patterns (de los Arcos *et al* 2014).

Similarly the K12 OER Collaborative, sets out to relieve states in the US from the burden of having to replace costly textbooks for K12 schools by paying publishers to produce open ones (http://k12oercollaborative.org/). There is a strong financial argument for this model. Taking just one state (Washington) their budget allows them to update two books a year across the whole K12 age range and curriculum. This means many set books are out of date before it's their turn to be updated, which usually takes place on an eight year cycle. For the same money to update two books a year, using the open approach, they could create open textbooks for all subjects. And these would, of

course, be usable across the whole of the US, not just in one state, as since they are openly licensed. In the US, the project estimates the figure for purchasing K12 textbooks is $8 billion nationwide, and estimates that this could be realised for approximately $30 million (Green, 2015).

For open access journals, there is a similar argument to shift financial resources from the purchase of journals to their production within universities. This model has been promoted by the Open Library Humanities (OLH) project (https://www.openlibhums.org/). This operates a range of open access journals in the humanities, with no author facing charges. It is funded by subscriptions from university libraries, which covers the article processing charges (APCs). These are kept low as the journals are hosted by the open access publisher Ubiquity Press, which charges £300 per article for copyediting and processing. According to OLH, with just 200 libraries in the consortium the contribution from each drops to $925 per year, (OLH 2015) a relatively small sum compared with the subscription fees for accessing many journals from the larger publishers. Knowledge Unlatched operates a similar model by sharing costs between libraries to make books available under an open licence (http://www.knowledgeunlatched.org/). As with OLH, if scale is achieved then the costs quickly fall for each individual library.

In terms of teaching, the open flip offers the potential to create a wide pool of teaching content. For example, the Blended Learning Consortium in the UK is a network of Further Education colleges, which charges an annual membership fee of £5,000. This money is used to pay staff members in member colleges to develop e-learning content which is suggested by the community, and which all member colleges then have access to. In order to gain continued funds, this content is not currently openly available, but a more nationwide consortium with government input could reduce costs further and make content open to all.

The open flip can also be realised by simply removing barriers to sharing, and encouraging open licensing from existing practice. For instance, in Leicester blanket permission was given across 84 schools for teachers to share the learning materials they created under an open licence (Fraser 2016). This is activity that is largely occurring already, funded by the state, but by making sharing the default option, it makes that content available for all. Similarly, the US Department of Labor launched a $2 billion programme, Trade Adjustment Assistance Community College and Career Training (TAACCCT), aimed at improving workforce and employability training. All new material produced through these grants were mandated to be released under a Creative Commons licence (Allen 2016).

Discussion

Many of the digital economic models have been poorly applied to the education sector, because they either do not recognise the differences in this sector from conventional retail, or they require the complete dismantling of universities and colleges. The open flip is a model that is more directly suited to both the financial structure of education spending, and in alignment with the aims of educators. It seeks to allow a more practical allocation of resources, and enriches the pool of openly licensed material that can be adapted for use by educators. Aside from financial benefits there are a number of pedagogic ones also. For example, Weller *et al* (2015) found some evidence that use of OER can improve student performance, and leads to reflection on practice by educators. DeRosa (2016) reports how the use of open textbooks caused her to change her practice by engaging students in the process of co-creation and editing the textbook. The use of open textbooks at Tidewater College led to an improvement in student retention and performance (DeMarte and Williams 2015). These findings

demonstrate that even at this early stage of an open flip approach, there is evidence that the benefits go beyond just financial savings.

This model should not be overused, the fate that has befallen many digital economic models. It is suited to very particular circumstances. For the open flip to be a favourable model then the following should apply:

- There is large scale spending on the purchasing of resources that can be practically refocused through single channels. This does not apply to standard consumer purchases, for instance.
- The resources are largely digital in nature, or production can be cheap. The main component in the purchase price relates not to the physical aspect but to the intellectual property. For instance, the wide range in prices for academic textbooks is not related to any physical characteristics of their production, which varies only by a small degree.
- The initial production of the content is a task that can be financed. With open source software and many community driven approaches, it has been found that money is not an effective incentive. These community driven, peer based models are more adequately explained by Benkler's model.
- Open licencing offers a particular benefit beyond just cost. While cost savings may be the initial driver, it is the advantages offered by openly licensed material that often sustains a movement. For example, the pedagogic advantages of adapting open textbooks.

Considering these factors there are other areas where the open flip might be applicable also, beyond education. For instance, currently governments and individuals spend billions on purchasing drugs from large pharmaceutical companies. There is often no incentive for such companies to develop drugs for illnesses, which will not reach a wide market. An open flip approach would invest government money in the production of drugs that are then openly licensed, so production is inexpensive. This would meet the criteria set out above as there is large scale investment from bodies such as governments, charities and international organisations; the production of drugs themselves is often cheap, but the ownership of the rights creates a high price to repay the development investment; there is an increase in drug development and innovation from openly licensed drugs that can be adapted and used in other contexts.

The digital, networked infrastructure is the substratum that allows this to happen, but it is open licensing that adds the final ingredient. Existing models of practice can become ingrained and have an inbuilt inertia but as the examples above illustrate, with appropriate funding and targeting, a more effective allocation of resources is possible, which better suits the needs of education.

References

Allen, N. (2016). U.S. Labor Department Adopts Open Licensing Policy. Retrieved from http://sparcopen.org/news/2016/dol-open-licensing-policy/

Anderson, C. (2007). *The long tail: How endless choice is creating unlimited demand*. London: Random House.

Anderson, C. (2009). *Free: The future of a radical price*. London: Random House.

Barber, M., Donnelly, K., & Rizv S (2103). 'An avalanche is coming: Higher education and the revolution ahead'. *The Institute of Public Policy Research.* Retrieved from http://www.ippr.org/images/media/files/publication/2013/03/avalanche-is-coming_Mar2013_10432.pdf

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven: Yale University Press.

Burke, L. (2015). Wanted: Uber-Ized Education. Retrieved from http://www.heritage.org/research/commentary/2015/2/wanted-uberized-education

Campbell, L. (2003). Engaging with the Learning Object Economy. In A. Littlejohn (Ed.), *Reusing online resources: A sustainable approach to e-learning* (pp. 35-45). London & Sterling, VA: Kogan Page.

Castells, M. (1996). *The rise of the network society, the information age: Economy, society and culture, Vol. I.* Cambridge, MA & Oxford: Blackwell.

Christensen, C. (1997). *The innovator's dilemma*. New York: Harpers Business.

Christensen, C. M., Horn, M. B., & Johnson, C. W. (2008). *Disrupting class: How disruptive innovation will change the way the world learns* (Vol. 98). New York, NY: McGraw-Hill.

Craig, R. (2015). *College disrupted: The great unbundling of higher education*. New York: Macmillan.

Cuthbert, R. (2010). Students as Customers. *Higher Education Review*, *42*(3), 3-25.

de los Arcos, B., Farrow, R., Perryman, L.-A., Pitt, R., & Weller, M. (2014). OER Evidence Report 2013-2014. OER Research Hub. Retrieved from http://oerresearchhub.org/about-2/reports/

Downes, S. (2007). Models for Sustainable Open Educational Resources. *Interdisciplinary Journal of Knowledge and Learning Objects, 3*. http://www.ijklo.org/Volume3/IJKLOv3p029-044Downes.pdf

Dvorak, J. (2004). The Myth of Disruptive Technology. *PC Mag*. Retrieved from http://www.pcmag.com/article2/0,2817,1628049,00.asp

Evans, P., & Wurster, T. S. (2000). *Blown to bits: How the new economics of information transforms strategy*. Boston: Harvard Business Press.

Fischer, L., Hilton III, J., Robinson, T. J., & Wiley, D. A. (2015). A Multi-institutional Study of the Impact of Open Textbook Adoption on the Learning Outcomes of Post-secondary Students. *Journal of Computing in Higher Education*, *27*(3), 159-172.

Fraser, J. (2016). Open Education for Schools – Policy & Practice. Retrieved from http://www.josiefraser.com/2016/03/oer-resources/

Green, C. (2016). *K-12 OER Collaborative.* Paper presented at *OEGlobal Conference,* Krakow, April 2016, Retrieved from http://conference.oeconsortium.org/2015/presentation/k12-oer-collaborative/

Gunn, C., Woodgate, S., & O'Grady, W. (2005). Repurposing Learning Objects: A Sustainable Alternative? *Research in Learning Technology*, *13*(3), 189-200.

Hamari, J., Sjöklint, M., & Ukkonen, A. (2015). The Sharing Economy: Why People Participate in Collaborative Consumption. *Journal of the Association for Information Science and Technology*. doi: 10.1002/asi.23552

Hilton III, J., Robinson, T., Wiley, D., & Ackerman, J. (2014). Cost-savings Achieved in Two Semesters Through the Adoption of Open Educational Resources. *The International Review of Research In Open And Distributed Learning, 15*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1700/2833

Larsen, K. & Vincent-Lancrin, S. (2005). The Impact of ICT on Tertiary Education: Advances and Promises. Paper presented at the *OECD/NSF/U Michigan Conference Advancing Knowledge and the Knowledge Economy,* 10-11 January 2005, Washington, DC.

Lepore, J. (2014, June 23). The Disruption Machine - What the Gospel of Innovation Gets Wrong. *The New Yorke.* Retrieved from http://www.newyorker.com/magazine/2014/06/23/the-disruption-machine

Meiszner, A., Glott, R., & Sowe, S. K. (2008). Free/Libre Open Source Software (FLOSS) Communities as an Example of Successful Open ParticipatoryLearning Ecosystems. *UPGRADE, The European Journal for the Informatics Professional*, *9*(3), 62-68.

Open Library Humanities. (2015). Summary of OLH. Retrieved from https://about.openlibhums.org/wp-content/uploads/2013/01/2015-Summary-of-OLH.pdf

Raymond, E. (1999). The Cathedral and the Bazaar. *Knowledge, Technology & Policy*, *12*(3), 23-49.

Rogers, G, (2014). The Uberization of Education. Retrieved from https://www.linkedin.com/pulse/20140603135511-20348008-the-uberization-of-education

Taleb, N. (2015). 'An Uberized education is when…'. Retrieved from http://www.blackswanreport.com/blog/2015/09/an-uberized-education-is-when/

Weller, M. (2014). *Battle for Open: How openness won and why it doesn't feel like victory*. London: Ubiquity Press.

Author:

Martin Weller is a Professor at the Institute of Educational Technology, The Open University, Milton Keynes, UK. Email: martin.weller@open.ac.uk