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UK Open Textbooks Report

2019

Executive summary

Open Textbooks are openly licensed academic textbooks, where the digital version is available freely, and the print version at highly reduced cost. They are a form of Open Educational Resource (OER) that has seen significant impact and success in the USA and Canada.

The UK Open Textbook project was funded by the William and Flora Hewlett Foundation with two main aims: firstly to promote the adoption of open textbooks in the UK, and secondly to investigate the transferability of the successful models of adoption to the UK. The project was led by The Open University (UK) OER Hub team in partnership with 2 US based open textbook providers and champions, OpenStax and the Open Textbook Network, and WonkHE and the University of the West of England (UWE).

Initial research into the differences between the US and UK context highlighted that textbook use in these two contexts varies considerably and that there was little existing research into UK textbook use. The UK Open Textbook project carried out both an initial literature review and a survey of UK educators during the project. The cost of textbooks is a more significant barrier in the USA, and their usage tends to be more heavily mandated. However, participation costs for UK students are increasing, and textbooks represent a contributing factor. In our 2018 survey with UK Higher Education (HE) educators, it was noted that whilst there is an initial low awareness of OER, respondents had a strong interest in pursuing their adoption.

UK Open Textbooks was a project focused on engagement. Through a number of workshops at a range of higher education institutions (HEIs) and targeted promotion at specific education conferences, the project successfully raised the profile of open textbooks within the UK. The project focused particularly on STEM subject textbooks and in spite of contextual differences between UK HEIs and their counterparts in North America there was considerable interest and appetite for open textbooks amongst UK academics. This was partly related to cost savings for students and institutions, but more significant factors were the freedom to adapt and develop textbooks. Open textbooks were also viewed as a possible means to counteract the disinterest of commercial publishers in developing books for smaller markets.

This report reflects upon the current use of textbooks at UK HE level and the potential for open textbooks. It contextualises and presents the tried and tested methods used to engage with stakeholders at events and workshops and reports back on our findings and outcomes from this activity. Finally this report

also presents some of the case studies curated and created during the project; illustrating current best practice and use of open textbooks.

The UK Open Textbooks project successfully raised awareness of open textbooks and OER over a one year period, and through the project's activity discovered that higher and further education is a potentially fertile ground for the use of open textbooks and further development in this area.

Attribution

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You can learn more about the Hewlett Foundation OER Programme at <https://hewlett.org/strategy/open-educational-resources/>.



Contents

Open Textbooks: Innovation in Education	4
Introduction	4
The use of textbooks in UK higher education	4
Open textbooks: a form of Open Educational Resource	5
The UK Open Textbooks Project	7
Rationale	7
Strategy	7
Method	7
Organisation	7
Findings	9
Workshops	9
Workshop Impact Statements	9
Subject Adoption	10
Survey Results	12
Main Findings	12
Case Studies	13
From Open Source to Open Textbooks at Birmingham City University	13
Wikibooks and Digital Media at The University of Stirling	13
Supporting Biomedical Science at The University of the West of Scotland	14
Using OpenStax for PGCE Courses at The University of Sunderland	15
Conclusions & Recommendations	17
Recommendations	17
Getting involved in the network	17
References / Further Reading	18

Open Textbooks: Innovation in Education

Introduction

The UK Open Textbooks project was conducted in several stages over the period of March 2017 to May 2019. The project tested two highly successful approaches to increasing engagement with, and use of, open textbooks. The first was promotion of open textbooks through display at national events and conferences, an approach used successfully by [OpenStax](#), an open textbook publisher based at Rice University, Houston, TX, USA. OpenStax have published almost 30 open textbooks and since the launch of the first book in June 2012 and their textbooks have been used by over 6.2 million learners (OpenStax, n.d.). In August 2018 OpenStax reported that their textbooks are now used by almost half of all US colleges (Ruth, 2018).

The second approach the project involved working directly with HEIs and running workshops on OER and open textbooks. This method is successfully deployed by the [Open Textbook Network](#), a membership network which connects and supports higher education institutions in their use of OER and open textbooks and which curates open textbooks in its online library. Open Textbook Network workshops run at member institutions result in 45% of faculty adopting an open textbook and the network currently has more than 600 members (Open Textbook Network, n.d.).

The use of textbooks in UK higher education

In a landscape defined by rising levels of student debt, both the “headline” issues of fee and maintenance loans and other forms of short term debt (such as private loans, loans from family members and overdrafts) it is unsurprising that there is rising concern around the costs of education from students themselves and those who support them. Textbooks represent - when viewed alongside fixed costs such as tuition fees and accommodation - an area where interventions can have immediate beneficial effects on student finances.

There can be some disagreement about what actually defines a textbook and its usage in higher education. JISC (2003) offer the following classification of textbook use:

- Course adoptions, selected by the course leader or team and usually associated with a body of factual knowledge or principles, and most frequently for the early undergraduate years, where class sizes can be very large in some subjects (over 100 students), although many postgraduate taught courses also rely on textbooks as well, especially those that are cross-disciplinary.

- Essential reading, without which students will not be able to complete their courses; and
- Recommended supplementary reading, which may be important at certain points in a course, and is of considerably greater importance in humanities and social science subjects.

The Publishers' Association yearbook (2016) note that:

“Students, especially in their first two years of study, are more likely to buy textbooks that are strongly recommended by their tutors. For arts and humanities subjects there is a tendency to buy more books, up to seven or eight, at relatively lower prices (below £20), while science and technology students are more likely to buy fewer, more expensive books. However, only in a minority of classes is there a single basic text used by the whole class, in the manner that is common in the USA.”

This observation reveals an important difference in textbook use in the North American context compared with that of the UK. Rather than “required reading”, students are presented with a reading list, which may (depending on the subject) contain textbooks, reference material, and primary sources either individually or anthologised. These lists are not limited to books - online resources, video/film and materials prepared internally may also be cited. In the North American model, one specified textbook is more likely to be used as the basis for a whole course.

In the UK, it is generally accepted that students will not purchase the entirety of a reading list. Rather, students may choose one resource to purchase and others to access via the library. On occasion, academic staff may steer students towards a small number of recommended textbooks, with the expectation that only one would be purchased.

Though textbooks and related resources form a central part of undergraduate tuition in UK universities, there has been little research into their selection, how they are recommended, sourced and used, any difference between disciplines, student experiences, the cost of textbooks and their effectiveness in realising learning outcomes. To date research has focused largely on electronic books and ease of access.



There is some evidence that the cost of textbooks to students is rising, although data is not robust enough to be confident as to the precise extent. For example, in the Department for Education (2018) report *Student Income and Expenditure Survey 2014/15*, students spent a mean of £572 on books and equipment in their first year, falling to £465 in year 2 and £490 in year three. As can be seen below, there was a significant difference in annual spending on books by discipline:

Table 1 - Annual student expenditure on textbook by subject (Student Income & Expenditure Survey, 2018)

Subjects Allied to Medicine	£110
Science/Engineering/Technology/IT	£39
Human/Social Sci/Business/Law	£84
Creative/Art/Languages/Humanities	£79
Education	£91
Combined/Other	£64

Prior to 2014/2015, the survey was last conducted for the 2011-12 cohort, when it was suggested students spend, on average, £459 on books, computers and equipment in their final year (up from £430 for 2004/5) (Department for Business, Innovation & Skills, 2013). A comparable survey for 2014/15 conducted by the Welsh Government (2017) suggested that this figure had risen to around £519 - with books accounting for £104 in that final year of study.

Moreover, there is evidence that UK students are becoming increasingly concerned around what is described as “participation costs” (Office for Students, 2018). These costs can include reading materials but also refer to other resources required, or field trips, the cost for which may not be stated upfront by the university (Ibid and Jacobs, 2015). In the 2018 Office for Students project involving a number of UK student unions 58% of students surveyed said that “essential course books” should be included in their course costs (Ibid, p.15). Similarly, an earlier 2012 NUS and CourseSmart survey revealed that over 80% of students surveyed felt their reading materials should be included in the cost of tuition (Duggan, 2012).

Whilst student tuition costs vary according to where you are based, England’s rapidly rising tuition fees were reported to be higher than US public universities with students graduating with over £50,000 of tuition fee and loan debt (Coughlan, 2017). A number of institutions are beginning to recognise the effect of

textbook costs on the student experience. University responses vary but include partnerships with e-textbook publishers and there are also a small number of UK initiatives including open access presses and publishers such as UCL Press and JISC’s recent e-textbook publisher project.

Conclusions

- Significant multi-methodological primary research is required to understand this situation in more detail, and needs to be a central component of any future work in this area.
- Textbook cost is an increasing area of concern and is a component of the rising participation costs of UK higher education.
- Textbook usage in the UK differs from North America, with a single textbook forming less of an essential component in the UK.

Open textbooks: a form of Open Educational Resource

Open Educational Resources (OER) have been part of the educational landscape since 2001 with the announcement of MIT’s OpenCourseWare project. There are several definitions of OER, but with a good deal of overlap between these. The William and Flora Hewlett Foundation, who funded the MIT project, define OER as:

“...teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.”

(Hewlett Foundation n.d.)

A key element to this definition is the stress on the license that permits free use and re-purposing. As the Hewlett definition of OER sets out, they can include textbooks. The field of open

textbooks has proven to be one of the most amenable to the open approach, and provides solid evidence of cost savings, and pedagogical benefits. Indeed, in much of North America, open textbooks have become almost synonymous with OERs. The premise of open textbooks is relatively simple – it is to create digital versions of widely used textbooks that are freely available and can be modified by users. The physical versions of such books are available at a low cost to cover printing. The motivations for doing so are particularly evident in the US, where the cost of textbooks accounts for 26% of a 4-year degree programme (Government Accounts Office, 2005). This creates a strong economic argument for their adoption.

There are a number of initiatives developing open textbooks, using various models of production. In the instance of OpenStax, the open textbook publisher partner in the UK Open Textbooks project, philanthropic funding enables the development of their open textbooks. Paid experts and authors produce comprehensive, curriculum aligned textbooks, which are then peer reviewed and regularly updated. E-versions of the books are available free to download and hard copies are available in different formats, via a number of different outlets for around \$40 (<https://openstax.org/bookstore-suppliers>). The books are released under a CC-BY license, and educators are encouraged to modify the textbooks to suit their own needs.

As well as the financial impact, there is evidence for an educational one, partly because the costs of textbooks prevent many students from purchasing them. Feldstein et al. (2013) reported that while just 47% of students purchased the paper textbooks, most due to finding them unaffordable, when they switched to open textbooks, 93% of students reported reading the free online textbook. Further research has demonstrated the efficacy and quality of such textbooks is as good if not better than existing ones (Fisher et al 2015). As use of open textbooks spreads, a growing body of research into their impact is also becoming available.

Perhaps one reason why open textbooks are proving to be a fruitful area for OER implementation is that they readily map onto existing practices. Open textbooks simply require an educator (or institution, state or country) to recommend a different textbook. As long as the quality of this book is deemed to be as good, if not better than the standard text, the cost savings alone become a strong driver for their uptake.

Conclusions

- Open Textbooks have seen greater adoption than other forms of OER
- They have realised more than \$1 billion of savings for students (Allen, 2018)
- Their quality and efficacy has been demonstrated to be as good, if not better, than traditional textbooks
- Their usage has largely been confined to North America.



[Image Credit: ASE Annual Conference 2018, Liverpool, UK \(by Beck Pitt\)](#)



The UK Open Textbooks Project

Rationale

Open Textbooks have seen impressive growth and impact in the North American context, with a variety of open textbook initiatives emerging including BCCampus and e-Campus Ontario in Canada. With the exception of initiatives such as Siyavula in South Africa however, the open textbook model has largely been restricted to North America. Whether the open textbook movements is a result of particular contextual dependencies (such as the relative cost of textbooks) or because North America is where the funding and interest has been focused is as yet unknown.

Partnering with OpenStax and Open Textbook Network enabled UK Open Textbooks to test two different but very successful methods of mainstreaming open textbook adoption within a different context.

Strategy

There were three key strategic ambitions for the piloting phase of UK Open Textbooks.

- To establish an open textbook network of champions. Comprising educators and librarians who are committed to using open resources. This follows of the contours of the approach used by OpenStax and Open Textbook Network.
- To influence subject specialist educators to promote specific books within their field, by working with subject specific librarians and through networks such as the subject specialist networks in the Higher Education Academy and ALT special interest groups, conferences and student advocacy groups. Strategically targeting key individuals, networks and conferences provides an important route to market.
- To enhance communication around open textbooks in the UK through amplifying voices and raising awareness via a social media campaign and select publications and reports.

Method

In order to assess the transferability of the OpenStax and Open Textbook Network approaches, a series of workshops and exhibitions of open textbooks took place from autumn 2017 until early 2018.

OpenStax raise awareness of open textbooks and engage with practitioners and decision makers through displaying hard copies

of their open textbooks at exhibitions, trade fairs and conferences. A USB with the complete digital collection of OpenStax open textbooks is offered to those who subscribe to hear more about OpenStax. Subscribers subsequently receive a series of personalised emails regarding open textbooks in their subject area. Educators who adopt an OpenStax book are also encouraged to advise of any adoption of resources. Prior to the UK Open Textbook project there were 15 known adoptions of OpenStax materials by 11,000 students (OpenStax, 2017).

The Open Textbook Network approach involves running subject specific workshops at member universities. These workshops introduce participants (primarily educators) to OER and open textbooks and provide advice on where to find this type of resource. The session ends with an invitation to participants to contribute an incentivised review of an open textbook from the Open Textbook Library. By encouraging educators to review a book in their subject area, helps to build up a collection of reviews by colleagues and provide evidence against claims that OER are of low quality. Workshop participants were also surveyed to see whether they were intending to adopt an open textbook as a result of the workshop and any subsequent activities.

Using the metric of adoption and feedback from educators gathered during or after the events we displayed textbooks at, or workshops, enabled us to assess whether a particular model or approach was more successful in a particular context. Both methods also enabled us to assess educator appetite for open textbooks, hear their concerns and experiences and better understand the UK context.

In addition, we also raised awareness of the project and open textbooks through participating in a range of other types of outreach activities with different communities. In total, between July 2017 and October 2018, we conducted a total of 14 workshops, 3 poster presentations, 2 webinars, 6 paper/conference presentations, 2 sponsor presentations, and exhibiting at 7 practitioner conferences. A full list of project outreach can be found at: <http://ukopentextbooks.org/outreach/>

Finally, further work to document and understand educator experiences with textbooks and OER also took place during the project in the form of case studies and a UK wide survey.

Organisation

The work was organised into work packages for management; research; subject and library adoption; advocacy and evaluation, as shown in Table 2.

Table 2 - Description of work for UK Open Textbooks

Work Package	Description
1. Research	This provided foundational research, setting out the current context for the use of textbooks in UK Higher Education.
2. Champion Network	These actions organized and conducted educator targeted workshops at universities across the UK and in the Republic of Ireland. The goal was to both inform participants and encourage the adoption of open textbooks, particularly through the incentivized review of curated open textbook collections as practiced by Open Textbook Network.
3. Subject & Library Adoption	The OER Hub team collaborated with OS to conduct a series of exhibitions, sponsorships and presentations at trade and industry events. Outreach was focused on STEM events but also included engagement with librarians and science educators at FE/secondary level.
4. Advocacy	The project sought to raise the profile of open textbooks in the UK. This was achieved through outreach and encouraging adoption. A sustainable network of advocates has been identified and could form the basis of a more sustained effort.
5. Evaluation	The impact of the project was rigorously evaluated and recommendations drawn about future open textbook activity in the UK.
6: Project Management	WP6 supported the successful delivery of the project. To ensure effective collaboration, regular online meetings took place between the project partners and working groups.



Findings

Workshops

The workshops followed the Open Textbook Network model closely, acting as a catalyst for discussion and institutional action. Due to the project's lifespan, we did not replicate the membership model but instead advertised the workshops via relevant mailing lists with an invitation for interested participants to get in touch with the project.

14 workshops were held at 8 institutions with 116 participants from UK and Irish Universities. 43 held full- or part-time academic positions and 29 were library staff. Many of these were identified as potential champions for open textbooks in the UK.

Of participants interested in reviewing a textbook, 33.3% of participants completed a review (35 out of 105). In a post-workshop survey 20 out of 49 participants intend to adopt an open textbook with a further 18 advising they would consider adopting. All those who said they would not be adopting a textbook were in non-teaching roles.

Key outcomes included:

- Senior level support for use of more open textbooks;
- Involvement in future phases of the project and strong interest in co-creation of content in addition to cost saving benefits;
- Planned promotion of open textbooks to staff and students on library websites
- Open textbooks being added as “recommended module reading lists”;
- Collaboration with libraries to investigate the potential cost saving on course production/rights clearance through OER;
- Expressed intention to share and discuss open textbooks with departmental colleagues and to strategize their use in new or existing modules;
- Participants have used the [CC-BY workshop slidedeck](#) to raise the profile of OER locally.

High level of demand for workshops resulted in a waiting list of institutions interested in hosting and taking part in the workshops during the next phase.



Picture: Viv Rolfe at The University of Sussex, November 2017 by Rob Farrow.

Workshop Impact Statements

The following are representative of feedback received from workshop participants:

“It was interesting reviewing [Introducing Marketing] – I am currently writing a chapter for a new Marketing text with colleagues, so it did make me think about the ethics of writing yet another marketing book that students are going to have to pay for! Who knows, maybe we will get our act together and write an Open Access text at some point in the future...”

Workshop Participant (Senior Lecturer, Business, Management & Marketing, Staffordshire University)

“Attending the workshop helped to broaden my mind and deepen my understanding of open learning practices. I think we are on the cusp of a paradigm shift with regard to these approaches becoming more mainstream so the workshop helped me to understand and internalise what is possible. I am on sabbatical this year but plan to include open learning resources in my reading lists next year.”

Workshop Participant (NUI Galway)

“It has made me think more about the importance of open textbooks. How I can sign post my students to utilise the open textbook directory, and how I may contribute towards this (e.g. submitting a book) in the future.”

Workshop Participant (Glasgow Caledonian University)

“First thing I did after the workshop is that I’m lecturing a module and what I’ve done now is I ordered an online copy to the university which makes it fully available to the students; so the university kind of pays for it, that access rights, the students can have an online copy. Before that I would have put a few books out, I tried my best to get a discount off the publisher for the students, but I think the open publishing [university] is available, definitely has impacted me in terms of not putting the cost onto the student because they have a myriad of issues they have to contemplate without adding a cost-base thing to the module I’m lecturing on.”

Workshop Participant (NUI Galway)

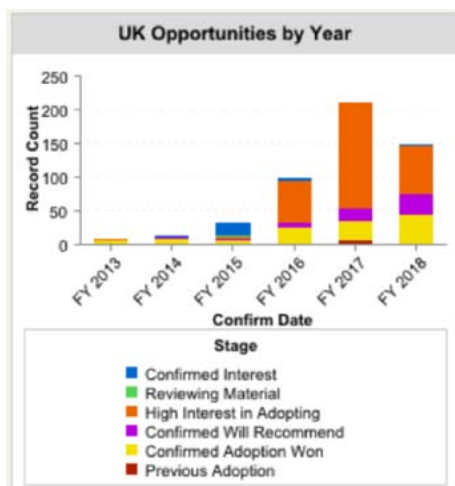
Subject Adoption

The focus of the OpenStax approach is adoption of open textbooks for use as primary teaching materials. We exhibited OpenStax STEM textbooks at 7 high impact practitioner events. Educators typically exhibited low levels of awareness of open textbooks and OpenStax, but high levels of enthusiasm and positive feedback about the quality of the textbooks. Although OpenStax textbooks are not aligned to the UK curricula, there was a consistently encouraging response to the basic proposition of OER adoption through textbooks.

85 verifiable OpenStax contact response cards were completed by participants at outreach events. 9 UK adoptions of OpenStax materials were reported as resulting in whole or part from the project’s activities. Figure 1 uses data from the OpenStax marketing database and reveals that the period 2016-2017 saw the number of persons with a “high interest in adopting” more than double.



Figure 1 - OpenStax: UK Opportunity by Year (Nov 18th 2018)



Conclusions

- When open textbooks were given to staff they showed high levels of interest in the concept, and a willingness to explore further
- The quality of the physical product was a significant factor in influencing adoption
- Awareness of open textbooks increased significantly as a result of the UK Open Textbooks project
- There was a range of isolated practices already in existence, dispersed across the UK, but no coherent approach.
- The two distinct US approaches were both effective in raising awareness and encouraging adoption, but tended to serve different audiences
- There is potential for expansion and a more unified national programme in this area.

Web analytics also indicate an upsurge of UK interest in OpenStax materials. From 20 May 2017 and 22 March 2018 there were 11,467 UK web views of OpenStax textbooks and 9,994 PDF downloads of materials. This represents an increase of 263% and 120% respectively on the previous year.

OpenStax reported a 19 month average time between early adopter UK educators being added to the database and confirming adoption of a textbook, suggesting that adoption impact can only be measured over a longer time period. The data we observed is consistent with initial patterns of textbooks adoption.

Survey Results

In September 2018 we conducted a survey of UK educators, primarily working in Higher Education in England. It revealed low awareness of OER and open textbooks but high levels of interest in their future use, particularly within the context of student cost savings and if open textbooks were easier to find. Around 50% of respondents expressed an interest in becoming part of a subject community producing their own open textbooks. The survey reinforced the findings from the initial literature review regarding the manner in which textbooks are recommended and used in higher education.

Main Findings

The survey (N=96) had two main sections: to ask participants about their use of textbooks, and their awareness of Open Textbooks and Open Educational Resources (OER).

80.2% of respondents indicated that they use conventional textbooks from commercial publishers or sections of textbooks in their teaching. A majority of the respondents (61.1%) reported recommending one or more core textbooks plus supplementary reading to their students.

Approximately half (52.3%) do not expect their students to purchase textbooks. Half (50.0%) recommend books in print form, while half recommend digital or a mixture of formats. The majority of respondents (72.2%) are solely responsible for the choice of textbooks for their teaching. The most frequent way of using textbooks in teaching was by making reading lists of textbooks available and expecting students to refer to them (52.2%) rather than being actively involved in teaching activities.

The top three highest agreement items in terms of what would influence textbook selection were whether the book is stocked in the library, whether it is available in accessible formats, and comprehensive content and learning activities. Items relating to cost and digital uses were considered to be lower priorities. In terms of textbook use more generally, three items showed high levels of agreement: Textbooks are recommended at start of term in handbooks or online; students supplement their learning through reading textbook; they are an important part of course and programme development discussions (with over 75% of respondents indicating 'agree' or 'strongly agree').

In relation to awareness of licensing mechanisms, Creative Commons lags behind public domain and copyright. Awareness of OER was low, with the majority of respondents either being unaware (42.7%) or having heard of them but not knowing much about them (31.5%). Levels of awareness in relation to Open

Textbooks were lower still, with 47.2% unaware and 28.1% having heard about Open Textbooks but not knowing much about them. A substantial majority (82.0%) do not currently use Open Textbooks in their teaching. However, most respondents were positive about their potential, being open to using them in the future, particularly if they were easier to find, and approving of the financial savings for students (over 60% either selecting 'agree' or 'strongly agree').

Comparisons were drawn between data from the survey and two other studies which incorporated comparable questions (Rolfe, 2018; Seaman & Seaman, 2017). While the surveys differed in their sample demographics and level of awareness in relation to Open Education, the level of agreement reported on the majority of questions and their relative importance showed consistency across all three surveys.

Within the current survey dataset, statistical tests were carried out in order to explore differences in responses according to demographic factors. Several items showed significant differences according to subject areas, although some of the subject sample sizes are small and no clear overall trend emerged. Instructional preferences were found to be associated with a range of significant differences in question responses.

Conclusions

- Textbooks are highly regarded as educational tools in the HE sector
- Textbooks tend to be recommended as part of a broader reading list
- Individual academics are the people with primary responsibility for recommending textbooks in their courses
- Awareness of open textbooks is low in the UK HE sector
- There was significant interest in further exploring the concept of open textbooks



Case Studies

As was reported in the previous section, there were a number of cases of open textbook adoption already in place in the UK. In order to establish a picture of how and why open textbooks had been adopted in these more mature cases, the project conducted a number of in-depth case studies. These case studies provide more detailed descriptions of the use and impact of open textbooks in UK higher education. They are based on semi-structured interviews with practitioners conducted as part of the project. These are edited version but the full write ups can be found on the UK Open Textbooks website at <http://ukopentextbooks.org/category/case-study/>.

From Open Source to Open Textbooks at Birmingham City University

Stephen Murphy, Associate Professor in the School of Computing and Digital Technology at Birmingham City University uses a range of openly licensed materials for his teaching, including open textbooks. Steve has been heavily involved in open source initiatives for the past 15 years and current involvement includes developing examinations for Linux with the Linux Professional Institute (LPI) as well as teaching using a range of “open source technologies” using open educational resources (OER).

Steve first became involved in open source software during his previous work in the software industry. Having access to free GNU licensed textbooks rather than proprietary textbooks (which cost ca. £40 each), during this period ensured that when Steve joined Birmingham City he was keen to use OER in his own teaching:

“...when I moved into education, probably about 10, 11 years ago, there was a lot of expensive textbooks that were required. We had a few of them in the library, but demand for them always outstripped supply. So when I started to come across some open-source textbooks, it sort of made sense to start using them as part of my teaching because it relieved the pressure on the library resource. And in fact, some of

those textbooks are now being stocked on the electronic library, alongside commercially licensed textbooks.”

Steve’s takes a “flipped” approach to teaching and uses two openly licensed textbooks, which feature as part of an online reading list for the Open Systems module. This module reviews different types of open licensing, technologies and legal frameworks whilst utilising appropriate OER. The materials Steve chooses to utilise for this course both reflect its ‘open’ ethos but also showcases current industry standards and emphasises “practical, hands on skills” that students can easily demonstrate to employers. This, Steve noted, is one of the course’s “unique selling points.”

Steve noted that he doesn’t adapt the textbook, largely because he uses the “flipped” approach but also because he prefers to “supplement” the OER he uses with materials he has created himself. His decision to supplement in this way in part reflects Steve’s experiences with the standard of proprietary supplied teaching materials, which he has frequently found to be poorly designed from a pedagogical perspective, error ridden or with lots of agenda:

“I sort of drifted away from using material supplied by third parties ... I just tended to use it really as ...the basic offering ... ‘This is what you need to know. Read this, and then we’ll talk about it and do more interesting things in the class with it.’”

Wikibooks and Digital Media at The University of Stirling

Greg Singh is Programme Director of Digital Media at The University of Stirling and a lecturer in media and communication. The Digital Media programme at Stirling is an integrated programme in conjunction with Forth Valley College and covers a range of practical and critical evaluation skills. Greg is responsible for delivery of *Digital Media and Culture*, a hands-on interdisciplinary module studied by undergraduate students across the Faculty. *Digital Media and Culture* explores “contemporary issues relating to online life” including communities, sharing information online, connectivity and the relation between self and online identity. The module also

explores the “familiar” and the “non-familiar” online in a range of ways, including utilising the open platform Wikibooks where students collaborate to co-create online open books (e.g. *Digital Media and Culture Yearbook 2014*).

Wikibooks: a way of thinking about actionable knowledge

Greg previously experimented with using Wikipedia however as an encyclopaedia meant it wasn't really suited to the kind of collaborative, creative group activities envisaged for *Digital Media and Culture*. Instead, Wikibooks was used to support critical engagement:

“With Wikibooks there is a bit of leeway in terms of thinking about critical engagement and thinking about original ideas... it really lends itself to more traditional modes of thinking and learning in Arts and Humanities, particularly in relation to building an argument, critical engagement with ideas and debates and also putting one's own stamp, one's own thoughts on a particular subject in order to develop one's own knowledge of it... within the open aspect of that platform, you're able to share that, and you're able to discuss those ideas... those things aren't fixed, they're living, they're still working, they're still improving, through discussion.”

Greg has used Wikibooks to facilitate the co-creation of content for the past 3 years. Each student is graded individually but works with others to complete the assigned project. Greg assigns each student to a group of around 4-5 persons. Each group is then responsible for generating a particular chapter of a book. Groups work together to produce material and comment/critique on others work. Given the size of cohorts it is often the case that there are multiple groups of students working on particular sections of a book – part of the challenge for students is to navigate and negotiate working with others and the different voices that arise during the of co-creation of content. As well as

improving students' understanding of specific topics, dealing with challenges such as these help to build skills needed in the workplace and provide ample material for reflecting on one's own practice.

Supporting Biomedical Science at The University of the West of Scotland

Robin Freeburn is a Senior Lecturer at the School of Science and Sports, The University of the West of Scotland. Teaching across all levels of the Biomedical Science and Bioscience degrees both Robin and some of his colleagues use OpenStax materials as part of their first and second year teaching. The module Cells and Molecules in particular utilises OpenStax and is often the first Biology course students study when they begin their studies.

The University of the West of Scotland (UWS) has “the highest percentage of students who come from disadvantaged backgrounds of any higher education institution (HEI) in Scotland” but also have, like many Scottish HEIs a drive towards using more open educational resources. The decision to utilise relevant textbooks was based on a number of factors:

- **Digitalization.** Robin had observed decreasing levels of both online and hardcopy textbook use by UWS students. Student access and use of online proprietary publisher resources had been low whilst sales of physical textbooks are in decline. This was thought to be limiting the ability of students to access a curated suite or “one-stop shop” of resources on Moodle (the Virtual Learning Environment used by UWS) on their internet enabled devices.
- **Cost.** A second connected consideration was the cost of textbooks themselves, which were deemed too high for many students.
- **Appropriacy.** It had to be clear that the resources used were appropriate for UWS students. As Robin remarked “the quality was perfect” for Level Seven teaching (the first year of University study in Scotland and equivalent to the final year of English A-levels) and the UWS context.
- **Licensing.** The open license on OpenStax materials made copyright permissions and acknowledgement easier. Lecture capture, and making lectures available online or on the VLE is used frequently for first year courses in particular at UWS and ensuring compliance with copyright can be difficult when using a mix of proprietary images and slides during lectures. OpenStax books have open which helps mitigate this type of concern and enable easy sharing and attribution.



Use of OpenStax at the University of the West of Scotland (UWS)

OpenStax's Biology textbook proved "mostly perfect" for the School's needs and is used by Robin and colleagues "no differently than any of the other textbooks." OpenStax is the "recommended text" for two terms of the first year, in addition to select modules in the second year. As student's progress through their degree they utilise more specialised "accrediting body recommended textbooks" as well as a wider range of academic resources such as peer reviewed journal papers.

Apart from some early issues with bandwidth for downloading the books, Robin reported that using the textbook content was hassle free and was compatible with the frequent updating of course material. It was also easy to align OpenStax Biology with the required curriculum::

"I've taken the parts that are relevant to the module and essentially ...taken the chunks that are covered ...and linked it to the corresponding section in moodle, rather than the whole text. In the case of the Biology one I've taken the first 20 chapters or so that we cover in the first Biology module. Then I think, Richard who teaches the second Biology module in trimester two, uses the chapters after that. We just basically adapted it so that it's the chapters that are relevant will be used for each module."

Finally, it is worth noting that resources are also introduced as 'open' at the start of teaching modules that include OpenStax and as part of a wider drive to "emphasise... copyright and proper referencing."

Using OpenStax for PGCE Courses at The University of Sunderland

Andy Fraser is a senior lecturer in the Education School at the University of Sunderland. With a specialism in science and maths pedagogy, Andy focuses on initial teacher training and education research on Sunderland's Post Graduate Certificate in Education (PGCE) and undergraduate Physics and Mathematics with Education programmes. The Education School at Sunderland is one of the largest higher education (HE) providers in the region and offers a large range of PGCE programmes including an international, distance PGCE qualification with a current intake of around 500 trainee teachers. The growing science and mathematics PGCE programmes have a current intake of 50 and 15-20 trainee teachers, respectively, during the 2017-8 academic year.

Andy currently uses a range of OpenStax materials within both undergraduate (UG) and postgraduate (PG) courses. For Andy the OpenStax science and maths textbooks provide a very coherent package of materials with thought given to delivery. With multiple pathways to take students from undergraduate to postgraduate level, OpenStax materials were used support both UG study and transition students into the science PGCE that Andy was reworking at the time.

Following review and integration, Andy began to use OpenStax in courses from early 2016 onwards. Andy explains the factors that were important during the development of the new iterations of these courses:

"I wanted to construct a set of Mathematics and Science resources which was open access for students and complemented existing purchased learning materials. I wanted to lower that burden by having information that was free at the point of use for our trainees, but also would stay with them after they left our institution. As a result, they would have materials they could take with them into that professional practise during and after the completion of their time with us."

The demographics for our university are very challenging. We have a number of students who join us who are not affluent, so empowerment and access to education for all and not being disadvantaged financially is a major driver for our city university.

One of the other drivers... was to identify materials which can be cut up, chopped up, and put back together in a way that suits our learners... so we wanted all sorts of materials, so we could move very rapidly, change our materials in light with changes to the national curriculum, so we wanted materials which would be very efficient to develop in the first place and very efficient to maintain. I believe we've managed that. We spent an awful lot of time looking at resources upfront, we didn't make any quick decisions."

Using open educational resources (OER) ensured that students had immediate and transnational access to course resources at no cost, in perpetuity. This is particularly important given the range of students that Sunderland serves and enables students on the distance-based international PGCE to have access to resources that were previously restricted due to national copyright laws.

In addition to the affordances of an open licence and adaptable content, having a no-cost resource at the core of your teaching enables resources to be used for other elements such as ICT or science resources. Further, the regular updating of the textbooks come with no cost to students or to Andy and colleagues, supporting rapid innovation and iteration.

Blending together a mix of OpenStax materials into Sunderland courses, and integrating material from the Physics, Chemistry, Biology, Calculus and Statistics books, was made easy as the books complement each other well, are "very comprehensive," and enable the development of a one-stop-shop or "one coherent source" across the science and math components of the PGCE.

Conclusions

Open Textbooks have been deployed for a number of reasons including:

- Immediate access to a free version for all students, particularly if the demographics of student cohorts means they may find the cost of textbooks a barrier
- The ability to remix, adapt, combine and add content
- The quality of the open textbooks available
- The ease of the digital format
- The "American" nature of many of the open textbooks was not seen as barrier to their usage despite issues around language and measures.



Image Credit: Dani Nicholson (OpenStax) at VICEPHEC17, The University of York (by Beck Pitt)



Conclusions & Recommendations

The UK Open Textbook project sought to implement two models of open textbook adoption that had achieved success in North America, represented by OpenStax and the Open Textbook Network. These were implemented into a higher education context with a growing awareness of the burden of textbook costs, but one where relatively little research existed on the use of standard textbooks. The UK model differed from the North American context in a number of key aspects: a single textbook does not form a central, mandated component in most courses; more academic freedom exists in the selection of texts; textbooks tend to form part of a broader reading list which may include articles and other resources. As a result, the cost of textbooks is not as strong a motivational factor in the adoption of open textbooks in the UK. This is likely to be the case in other countries also, particularly when student fees are lower, or non-existent (as in Germany for instance), so the cost of textbooks is not such a contributing factor in overall student debt.

The awareness of OER and open textbooks is typically very low in the UK HE sector. However, awareness of open access publications is high, supported by the Finch Report and REF policy on open access deposition. Although existing knowledge of open textbooks was low, once educators were made aware of them, they expressed significant interest in their adoption. This provides an existing conceptual model and set of practices on which to build.

With limited time and resources, the UK Open Textbook project managed to significantly increase this awareness, by significantly targeting major disciplinary conferences and conducting an intensive programme of workshops. Our findings suggest that a larger project could rapidly achieve significant awareness across the UK HE sector which is smaller and has a number of differences with HE sectors abroad.

We identified a small, distributed set of individual practitioners working with open textbooks already in the UK. Their primary motivations for doing so were the immediacy and ease of access to free digital resources; the ability to experiment and adapt such resources; and the opportunity to innovate on pedagogic models with openly licensed content.

Recommendations

From these conclusions, the following recommendations are proposed for the UK, and for open textbook adoption in all contexts outside of North America.

UK HE Recommendations

- A nationally funded project can rapidly promote awareness of open textbooks, using the combination of targeted conferences and institutional workshops.
- The open textbook model can be promoted by building on existing knowledge of open access
- The motivations for open textbook adoption may be couched less in terms of financial savings than they are in North America. Alternative talking points include the ease of access, pedagogical advantages; innovation; provision for smaller markets which are not well served by commercial publishers (eg Welsh Language) and co-creation of knowledge.
- The use of the reading list represents an advantage in that it is relatively straightforward to make one item on a reading list an open textbook without requiring substantial change to a course. This presents a lower threshold for staff to engage with open textbooks compared to adopting an open textbook for a complete course.
- Librarians exhibited strong interest and are responsible for the budgets relating to textbook purchasing, and they represent a key stakeholder in open textbook adoption.

General adoption recommendations

Generalising from the UK Open Textbook experience, we make the following recommendations for any project or agency considering the adoption of open textbooks:

- Conduct foundational research or literature review to gain an understanding of the use of textbooks in the HE sector currently.
- Adapt the message of open textbook benefits to suit this context.
- A combination of the targeted marketing and institutional workshop method should be adopted.
- Acquire physical products from a high quality open textbook provider, such as OpenStax, as these have a strong 'emotional' impact.
- Involve other key stakeholders, such as librarians, regional funders, and communities who may benefit from the open model

Getting involved in the network

The easiest way to stay in touch with the project is to follow us on Twitter (@UKOpenTextbooks). Our project blog also contains the most up to date information on our activities in addition to providing a range of case studies, resources and information on other open textbook initiatives: <http://ukopentextbooks.org>

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