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HEA/JISC Open Educational Resources case study: pedagogical development from OER practice

Collaborative development of Open Educational Resources
for open and distance learning

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Outline

Open and distance learning (ODL) is mostly characterised by the up front development of self-study educational resources that have to be paid for over time through use with larger student cohorts (typically in the hundreds per annum) than for conventional face-to-face classes. This different level of up front investment in educational resources, and increasing pressures to utilise more expensive formats such as rich media, means that collaborative development is necessary to firstly make use of diverse professional skills and secondly to defray these costs across institutions. The Open University (OU) has over 40 years of experience of using multi-professional course teams to develop courses; of working with a wide range of other institutions to develop educational resources; and of licensing use of its educational resources to other HEIs. Many of these arrangements require formal contracts to work properly and clearly identify IPR and partner responsibilities. With the emergence of Open Educational Resources (OER) through the use of open licences, the OU and other institutions has now been able to experiment with new ways of collaborating on the development of educational resources that are not so dependent on tight legal contracts because each partner is effectively granting rights to the others to use the educational resources they supply through the open licensing (Lane, 2011; Van Dorp and Lane, 2011). This set of case studies examines the many different collaborative models used for developing and using educational resources and explains how open licensing is making it easier to share the effort involved in developing educational resources between institutions as well as how it may enable new institutions to be able to start up open and distance learning programmes more easily and at less initial cost. Thus it looks at three initiatives involving people from the OU (namely TESSA, LECH-e, openED2.0) and contrasts these with the Peer-2-Peer University and the OER University as exemplars of how OER may change some of the fundamental features of open and distance learning in a Web 2.0 world. It concludes that while there may be multiple reasons and models for collaborating on the development of educational resources the very openness provided by the open licensing aligns both with general academic values and practice, but also with well-established principles of open innovation in businesses.



Introduction

The co-creation of educational resources and courses is a major feature of ODL institutions where teams of academics (supported by media professionals) develop and deliver the teaching and learning experiences, including tutors or associate lecturers who 'teach' around the main, carefully crafted, prescribed educational materials. At the OU there may be as many as a dozen academics writing for and commenting on other's work in the same course team to develop these carefully crafted educational materials and associated activities. They also work with media and technical professionals to plan and design materials in multiple media and formats to best suit the needs of the learners. This is 'team-based teaching' that can seriously challenge your thinking and has encompassed some of the most heated academic discussions I have ever witnessed both on pedagogy and subject-based matters! However, it does produce high quality materials, albeit at high initial investment cost and in a clear institutional framework.

Due to this high investment cost in educational materials, particularly rich media, and the host courses, many ODL institutions, either as a general policy or as part of establishing themselves when new, will license and use the material or courses already developed by another ODL institution. Often the licence will allow for some adaptation and modification, and occasionally there have been collaborative efforts at co-creating materials or courses, but these often prove difficult to manage for contractual, organisational and cultural reasons. There is not an extensive literature on the processes that make up good collaborative development of curriculum or educational materials in particular compared to the vast literature on team-based working in industry in general. Higgins Hains *et al.* (1999) do provide an overview of collaborative course development through distance learning aimed mainly at colleagues; Hawkes and Coldeway (2002) compare team vs. single faculty development of online courses; while Chao *et al.* (2010) and Xu and Morris (2007) look at how quality standards and face-to-face teaching methods respectively influence the collaborative development of online courses. Indeed the recent increase in the uses of information and communication technologies has led to general studies on how virtual teams might operate as effectively as non-virtual or distributed teams (Hertel *et al.*, 2004). Hixon (2008) provides a good overview of possible collaboration models and makes these recommendations for good team-based working for course development:

- ensure that everyone on the team fully understands their own role and expectations as well as the roles and expectations of all members of the team;
- ensure that everyone on the team has a clear understanding of the collaboration model and how communication should occur;

- designate someone in the team as a 'project manager' and ensure that individual has sufficient time to dedicate to the project;
- allow for flexibility within the collaboration model, but think through the possible long-term effects of any modifications;
- ensure that faculty have a prominent role in the collaboration and maintain control of instructional decisions;
- ensure that there is frequent and inclusive communication consistent with the collaboration model.

Such recommendations follow best practice in the general literature on organised team working, but do they apply in situations where there is community-led involvement in the co-creation of educational materials as is encouraged by Open Educational Resources? So far two models of collaboration appear to be developing in these more open communities. The first is one where a website acts as the arena in which such activity can happen such as with Curriki (Kurshan, 2008) and activities are carefully structured to meet the need of a particular community of practice (in this case mainly school teachers), although the scale and nature of collaborative effort in material rather than collective knowledge sharing is not always clear. The second is also focused on a community of practice, in this case volunteers translating existing English language OER into Chinese (Lee *et al.*, 2007), in which again it was collective knowledge sharing rather than collaborative development that dominated activities. Although attempts have been made at community-led collaborative co-creation, e.g. Wikiversity¹, there has not yet been much evidence of a model of collective development of educational resources to match the communities that operate around open source software or seen with knowledge based sites such as Wikipedia.

While supportive team teaching in relation to materials development can occur within and institutions, can such synchronous collaboration and co-operation occur between institutions and across borders and will (open) teaching become more of a collective than an individual activity in future? This is a bigger step than the expected asynchronous and sequential 'improvement' of OER that is expected, i.e. teacher or institution X takes content developed by teacher or institution Y and adapts it for their own use and purposes without much, or any need for, communication or collaboration between the two. This is typical reuse or repurposing, and while still not as common as many would like, it is growing in scale internationally as individuals and institutions learn how best to do so. A good example of such sequential adaptation can be seen in the case of UnisulVirtual adapting OU content² on the latter's OpenLearn platform (Mendonca *et al.*, 2011) or the adoption and use of OpenLearn technologies and practices by three English universities through the POCKET project (McAndrew and Wilson, 2008).

What follows is an examination of three cases of collaborative materials development for use in ODL that are still in progress or just finishing. Each has taken a different approach from which some similar and some different lessons are emerging.



Case study I: LECH-e and interdisciplinary education

This case study is heavily based on Teixeira *et al.* (2011), Wilson *et al.* (2011), Wilson and Abbott (2012) and some internal OU documents that explore the evolution of an innovative, integrative approach to climate change through collaborative production of an interdisciplinary education curriculum incorporating student mobility. It covers a European Union Erasmus project, 'The lived experience of climate change: e-learning and virtual mobility', which brought together eight universities³ plus an umbrella association, the European Association of Distance Teaching Universities, across six countries. The LECH-e project⁴ was an interdisciplinary e-module development and virtual mobility project that between 2010 and 2012 developed learning resources on the topic of climate change, aiming to contribute to an informed and active European citizenry and to inform EU policy. The project has developed a set of postgraduate curriculum resources on climate change that will become globally accessible. It has recently piloted them to 25 students drawn from these universities. After being completed and tested the learning resources have been released as OER so that other institutions are free to integrate or adapt the resources into their own formal and non-formal courses.

In more detail, the project partners have collaboratively developed four Masters-level innovative teaching modules and a virtual learning space in order to create a European community of scholars, students and citizens who can collectively contribute to the UN's decade on education for sustainable development. The OER are being used for student support and general interest without assessment and accreditation and as formally assessed and accredited modules as part of related

¹ <http://www.wikiversity.org>

² See: <http://labspace.open.ac.uk/course/view.php?id=3194> and <http://cloudworks.ac.uk/cloud/view/3617>

³ The Open University, United Kingdom; FernUniversität in Hagen, Germany; Universidad Nacional de Educación a Distancia, Spain; Open Universiteit Nederland, Netherlands; Universidade Aberta, Portugal; Katholieke Universiteit Leuven, Belgium; University of Derby, United Kingdom; Wageningen University, Netherlands.

⁴ <http://www.leche.open.ac.uk/>

postgraduate qualifications. The partners have also been free to use and/or adapt the OER into their own programmes through their own accreditation processes. The OU has done precisely this, first testing the resources as a pilot module as part of the formal project and after this successful testing, rapidly introducing a new postgraduate module (T869 'Climate change: from science to lived experience') that will shortly be an option in two OU Masters programmes – Global Development Management and Environmental Decision Making.

The curriculum resources have been designed to complement existing or planned taught postgraduate programmes in the participating universities and beyond. At the project end in April 2012 they were released as OER where any institution is free to appropriate them for its own curriculum. The potential for full accreditation of T869 within the OU was part of the design of the original pilot for credit. Accrediting institutions may adapt the materials if they wish, but under the terms of the Creative Commons licence for OER, any adaptations will be subject to the 'share alike' clause and should also be placed as OER.

The pilot took place between May and November 2011 and involved 25 students in total from the six European universities that participated. Five OU students completed the pilot as the T869 cohort, conceived in OU terms as a 30-credit module with three TMAs and a single examinable component of assessment at the end of study. All students who participated in the pilot have been surveyed regarding their experience and the materials were revised in the light of the feedback received before becoming OER in April 2012. Headline results emanating from the pilot evaluation were:

- 96% would recommend the module to others;
- 90% agreed or strongly agreed that the module materials are of high quality;
- 86% agreed or strongly agreed that the student mix achieved by international university collaboration has significant added value;
- 95% agreed or strongly agreed that interaction with other students enhanced their learning experience.

The curriculum resources were developed in line with OU quality processes that involved peer review of drafts, two external assessors (one for content, the other for pedagogy) and the oversight of the Project Leader. Interim external assessor reports have been produced and were positive. These reports were a further input into post-pilot revisions.

A key element of the pilot comprised e-learning communities, which were conceptualised as an experiment in virtual mobility, bringing students and academics from the participating universities together in structured activities and discussion. Assessed, structured teamwork in these communities developed the key skill of 'transboundary competence', where team members discuss and negotiate across deep differences of culture and standpoints. Transboundary competence is conceived as both a citizen and a professional skill.

So, collaboration has been about more than just common development of resources. First, the whole notion of practical environmental education is of reflecting upon and changing existing behaviours. Thus the whole process of both development and sustained delivery has involved an inclusive notion of environmental education. It is managing to involve formal, informal and non-formal learners in the production, reproduction, dissemination and preservation of knowledge on climate change. The e-learning materials have been designed to combine knowledge of the global mechanisms of climate change with local experiences of impacts. They have also involved both interdisciplinary and transboundary knowledge and skills and concepts to ensure that they have wide applicability as OER.

Second, through both the OER themselves and the virtual learning space the project is promoting the development and sharing of Masters theses on the topic of the 'Lived experience of climate change', which will form an important dataset for (a) advocacy with policy makers on climate change and (b) further research into this under-studied topic. Thus the development and sharing of resources will go far beyond the original set of materials.



Case study 2: TESSA and inter-institutional collaboration

This case study is heavily based upon the account in Wolfenden (2008), Wolfenden *et al.* (2012) and related publications. Over the last few years The Open University has been involved in an audience-specific OER programme: the Teacher Education in Sub-Saharan Africa (TESSA) initiative (see <http://www.tessafrica.net/>). TESSA is a consortium of institutions concerned with the collaborative production of original OER to support teacher development. The major funding for the TESSA initiative has come from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation.

TESSA has five distinct characteristics. First, it is a global consortium, including organisations like the BBC World Service Trust and the Commonwealth of Learning, as well as the South African Institute for Distance Education (SAIDE), but it is focused on the needs of teacher education in nine African countries⁵. TESSA is a consortium of 18 national and international organisations including 13 institutions in Sub-Saharan Africa, who are using the TESSA materials in a variety of teacher education programmes including ODL options (for further details see [TESSA in Use](#)). Second, as an OER initiative it is unique in being audience specific to teachers. Third, in TESSA the user, the teacher-educator, has been at the centre of the initiative. The vast majority of the OER have been created collaboratively by teacher-educators from across Africa (over 100 authors have been involved). The developments of both materials and the portal have involved extensive consultation with potential user groups building on local knowledge, materials and approaches. In contrast, most OER projects transfer materials from existing courses to an open platform; often materials in each course originate from only one or two authors. Fourth, the TESSA initiative is creatively exploring the use of OER audio content. Both different formats – drama, interviews, features – and modes of delivery including radio, CD and use of mobile phones. Lastly, significant time and resources is being put into the implementation and use of the resources, an aspect given insufficient attention in many OER initiatives.

In TESSA the project design has allowed the consortium to look in detail at issues such as adoption of the resources for different environments and how best 'users' can be supported in understanding ways of integrating the materials into what have been termed 'learning pathways'. TESSA development teams are actively exploring issues of reuse and interoperability. Colleagues across the partner institutions have not been seen as consumers of imported educational material but rather as collaborators in content production, distribution and utilisation. Awareness of the current situation in these institutions together with likely short- and medium-term contexts for exploitation has been at the centre of TESSA OER development.

The dynamics of the TESSA consortium can be represented by Figure 1. All 18 partner institutions contribute to the strategic direction of the initiative through regular workshops, meetings and electronic discussions. Each partner institution is represented on the 'Partner Advisory Council' (PAC), the key governance forum for TESSA activity. Support for PAC is provided by a group of academics and administrators from The Open University. Working in a consortium across several countries inevitably brings challenges of co-ordination and communication; these are vastly increased by the unreliable and uneven infrastructure found in much of Sub-Saharan Africa. Regular workshops in different locations across the region have been pivotal in maintaining momentum, building relationships and shared understandings.

Work around the four areas of activity – research, technological development (the TESSA portal), curriculum (TESSA study units) and take-up – is determined in detail by a smaller working group for each area. Different partners input to different areas of activity. Some, such as the BBC World Service Trust, have been involved almost exclusively with only one sphere of activity, in this case production of curriculum materials. Other partners have contributed to several strands of activity, represented by the links on the represented diagram. All 13 institutions in Sub-Saharan Africa involved in teacher education have contributed to activity around implementing use of the OER in courses and programmes. Central to this model is the multi-directional interplay between the concurrent different strands of activity. The structure and nature of the curriculum, for example, has been informed by planned contexts for use (take-up), by the forms of technology available for distribution (technical) and by research activity within the project. The latter has included fieldwork exploring the lives of female primary school teachers living and working in rural or semi-rural areas in Ghana, Nigeria, South Africa, Kenya and Sudan.

⁵ Ghana, Nigeria, Kenya, Rwanda, South Africa, Sudan, Tanzania, Uganda, Zambia.

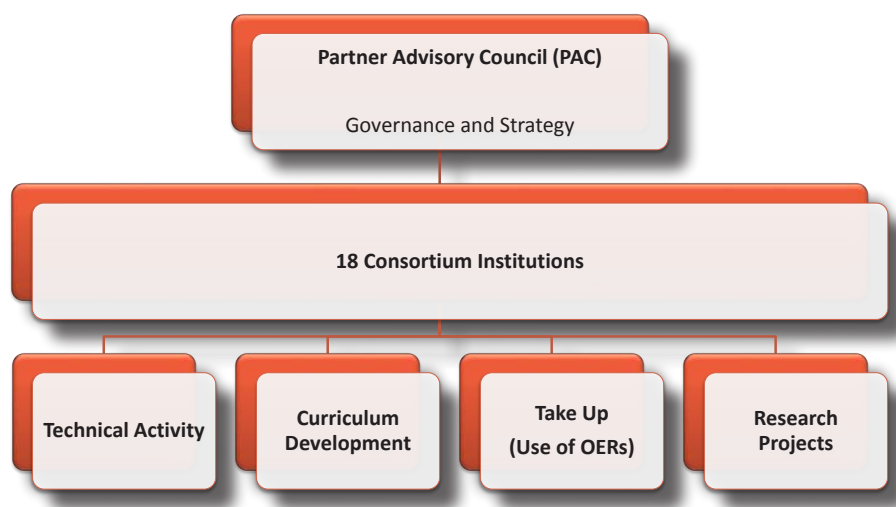


Figure 1: TESSA organisational structure (Wolfenden, 2008)

At the level of producing and authoring, TESSA OER were designed and created collaboratively by teams of academics from across Sub-Saharan Africa through numerous workshops at locations across the region and virtual working. Three characteristics of this process are of interest.

Firstly there was a very clear target audience for the TESSA OER: teachers working in challenging circumstances in basic education across the region.

Secondly, drawing on previous work at scale, the team proposed a template approach to the development of the TESSA OER. Thus the OER were conceptualised as 75 study units, each written in the same highly structured template.

Thirdly, it was recognised early on in the process of developing the OER study units that different versions would be required for each setting (defined at country level) – adaptation would be needed to ensure that representation of ideas was meaningful to the teacher’s context or situation. Thus adaptation of the original 75 units for each of the nine country contexts was part of the formal process of development of the TESSA OER.

The TESSA study unit template comprises:

- three learning outcomes for the teacher;
- three activities for the teacher to undertake in the classroom with their pupils;
- three case studies describing an individual teacher’s experiences with the associated activity or a similar activity;
- a threaded narrative linking the activities and case studies;
- up to six resources (for example, subject information, examples of pupil work, lesson plans, pictures, stories and worksheets to use with the pupils, etc.).

Each component of this template also has a very clear word limit.

TESSA aimed to create learning materials that could be shared and easily reused in a variety of contexts, reflecting local contexts, needs and cultures without complete reworking. Adaptation of the study units was to ensure that the materials spoke to experiences of teachers in a particular context while retaining the integrity and internal consistency of the OER.

In doing so there were a number of challenges. Adapting the work of academic colleagues proved to be a steep practical and cultural learning curve. For many lecturers making changes felt disrespectful to the original author, implying a criticism of the author’s work. Across the different sites we noted different levels of computer use and digital working. Cross-cultural working

inevitably holds many challenges; the main source of tension in this process was deadlines – different perceptions of their meaning and importance between the OU and the TESSA partner institutions. Often these deadlines were tied to funding milestones and determined by administrators outside the immediate TESSA team. What was perceived to be realistic from the perspective of a British university was often not possible when means of communications were unreliable, where ICT competence and confidence were low and where internet access was sporadic.

To mitigate these challenges TESSA devoted considerable resources to running a dozen workshops that occupied almost a year. Through these workshops lecturers were engaged in a joint enterprise that shaped their learning of the nature of OER and fostered ownership of the OER – a blurring of the division between content producer and content user. The TESSA OER process has also been grounded in the use of templates, building on work with templates in previous projects. Those same templates enabled the wide sharing of good practice in design of pedagogically rich learning episodes, facilitated consistency of the learner experience and avoided incorporation of large quantities of additional material.



Case study 3: openEd2.0 and open course collaboration

This final case study is based upon the project website⁶, various online presentations by project members and Aczel *et al.* (2011). The EU Lifelong Learning Programme and Swiss Government funded openEd project comprises a multidisciplinary partnership that includes seven European partners – higher education institutions, enterprises and non-profit organisations⁷. The openEd 2.0 project is applying principles of open source communities to the development and delivery of a course on Business and Management Competencies in a Web 2.0 World; in particular it is being run as a free and open course with the objectives of evaluating the applicability of such approaches, and examining the evolution of content and communities, speed of innovation, quality of learning provision and learning outcomes, and possible revenue models to support such types of free/open learning provision within cross-cultural and multilingual settings. The openEd 2.0 course consists of ten modules derived from existing OER allowing participants to choose the individual modules they are interested in. The partners drew on a number of content sources. The Open University provided material from a postgraduate educational technology research module, supplemented by business and management content from OpenLearn (<http://www.open.ac.uk/openlearn>), while the Hellenic Management Association made available materials derived from those used in face-to-face training.

The openEd project is also developing experimental approaches for participatory learning within open educational environments by implementing and testing those approaches by means of three consecutive pilots to promote continuity, community building and evolutionary growth. The piloted open course does not award any credits, though it is aimed to test 'for fee' assessment and credit award mechanisms as part of the sustainability framework that will be developed. The course is truly open to: the project partners' student/trainee population; educational providers outside the project partnership; and free learners outside of formal education. Can making content more widely editable, reusing learning resources and sharing responsibility for course delivery result in higher production speeds, better materials, and lower costs? The openED 2.0 project is trialling a hybrid organisational framework of open inter-institutional course production and global open course delivery that seeks to explore these issues.

The openED course has been designed and delivered using a hybrid organisational framework that was developed and piloted within earlier research projects. This framework posits that OER constitute just one element of open education and that OER should be embedded within an overall 'open educational service' concept. In such a concept, education is not understood as a 'finished product' to be sold and consumed, but as part of a service-based educational economy in which open educational services would be generally characterised by: independence (by-and-large) from existing physical educational infrastructures; self-organised community-based learning processes; community-based production of learning materials; and flexible learning and teaching roles. The hybrid organisational framework also pays close attention to retaining the artefacts created by learners, capturing learning processes and activities, and embedding all of this within the course in a way that enables others to re-experience later.

The openEd 2.0 course (see Figure 2) is not the first free and open course, and likely not the last one, and prominent cases, such as the [Connectivism and Connective Knowledge \(CCK\) course](#) or the [Introduction to Open Education course](#), provide some insights on the nature of open courses. However, the emergence of open courses is not limited to the area of educational sciences, and one area perhaps even more advanced is the one of Computer Science Software Engineering. Blurring boundaries between formal higher education course and participatory learning within online open educational environments is something that can be frequently observed today within the area of Computer Science Software Engineering education on the one side and Free/Libre and Open Source Software communities on the other side. Research carried out

⁶ <http://www.open-ed.eu/>

⁷ Sociedade Portuguesa de Inovação; The Open University; European Learning Industry Group; Aristotle University of Thessaloniki; Hellenic Management Association; University of Applied Sciences Western Switzerland; United Nations University UNU-MERIT.

by the [Collaborative Creativity Group](#), of the United Nation University's UNU-MERIT, further shows that employers value practical experiences within Free/Libre and Open Source Software communities as much or higher than a formal higher education degree within Computer Science Software Engineering. For the area of Computer Science Software Engineering it is therefore the question on how to systematically combine the different types of educational landscapes involved, which is the focus of the [openSE project](#), which could be seen as a 'sister project' of the openEd 2.0 project since both of the projects share a number of underlying approaches, methodologies and technologies.

As the [FLOSSCom project](#) has shown, the open source model, like much of the Web 2.0, shows how users can become active 'resource' creators and how those resources can be reused and freely maintained by developing and implementing respective frameworks and revenue models.

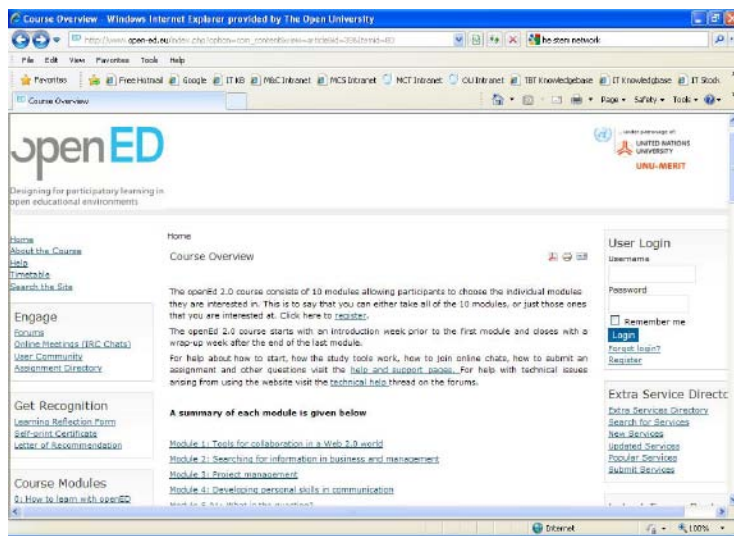


Figure 2: Screenshot of the online openEd 2.0 course

The openEd 2.0 and the openSE projects are tackling two characteristics that are predominant in formal education and preventing it – almost per se – from taking full advantage of the opportunities the web provides: 'closedness' and 'semester-based structures'. Closedness prevents the learning resources of one institution being improved by the outside world, or enhanced through external sources that are brought in by individuals or through technology. Semester-based structures on the other hand provide a challenge to establish a learning ecosystem that would allow for continuous and evolutionary growth; on a community level, including the full spectrum of participants ranging from newbies over advanced learners to old foxes, as well as on a learning resource level. Such a learning ecosystem would be desirable as it connects learning resources to learning processes (and related discourse) or provides the possibility to establish peer support, correction, development or even assessment systems.

The openEd 2.0 and the openSE projects are applying principles of open source communities within an open educational framework that will be open to formally enrolled students, fellow university students and free learners outside of formal education, as well as practitioners and enterprises. It is aimed to foster participatory learning experiences, involving practical 'hands-on' sessions where participants' learning activities and the things they create will become learning resources themselves. Future learners should be enabled to benefit from earlier achievements and build upon them, instead of starting from scratch.

Traditionally, in closed formal education, students cannot fully benefit from and build upon the achievements of previous student cohorts or firms and learners outside of the institution. Similarly, learners outside traditional educational institutions cannot benefit from students' learning processes and outcomes inside these institutions. In contrast, the Web 2.0 offers opportunities for open and inclusive education. Open source communities, for example, have proven that volunteer collaboration can outperform traditional ways of knowledge creation and sharing, which are the cornerstones of innovativeness.

The openEd project has not yet been completed at the time of writing but some preliminary findings are:

- adopting an open educational service approach introduces much more complexity than simply reusing OER;
- issues of international, inter-institutional curriculum design include languages, student support levels and coherence;
- issues of designing learning from international online participation include timetabling and varying levels of participant commitment;
- issues of OER reuse include audience and author motivations.

A challenge for inter-institutional design is reconciling different expectations and traditions of designing and writing courses; for example, it was found that terms associated with assessable student output such as 'assignment', 'assessment' and 'learning project' have been interpreted or used slightly differently by module authors and facilitators. Another danger of adopting a distributed process of course design is a lack of coherence. Some consistency in structure, style and terminology was introduced after the first drafts were published, but big differences remain. Also, so far there is only limited evidence of a design culture similar to that of other open source communities. Despite well over 300 course registrations, including other teaching professionals, no direct changes have been made to the module content by people outside the project team.

More research is being done over the rest of the project, particularly looking at the development trajectory of materials by the community over time, the pattern of participant interactions, the quality of participants' work, the usability and functionality of the technical infrastructure for learners and authors, the trialling of models for sustaining the course, and the evolution of the community participating in the course.



Learning from OER

Despite the lack of detailed evidence on successful collaboration around OER development there are a number of emerging initiatives and projects that are beginning to demonstrate the advantages and disadvantages of such a model of supportive open teaching. The three OU-related case studies described above highlight that open licensing is the means to a different end in each case, with varying involvement of ODL in the initiatives.

The TESSA collaborative model has worked through:

- having a very specific purpose and need in mind – Teacher Education in Sub-Saharan Africa;
- an agreed template for structuring the OER;
- agreed modes of working when drafting and reviewing the OER;
- allowing for local adaptation of the way and form in which the OER are used in practice (only some of which directly involve ODL);
- developing an inclusive governance structure.

This model has many of the planned features of good teamworking and distributed working that can be found in many successful multi-institutional projects, as noted earlier, with the main innovation being the ways that open licensing frees up the thinking and practices of the participants in relation to the educational content they develop (Lane and McAndrew, 2010). The OU has facilitated the initiative but does not directly benefit from the OER themselves. A number of other organised projects are testing out similar or different models of cross-institutional, multi-national, collaborative co-creation of educational resources. The Virtual University of the Small States of the Commonwealth⁸ has separately developed many of the same attributes as TESSA in structuring how it is co-developing content among institutions scattered all through the world (West and Daniel, 2009).

In contrast, the LECH-e project⁹ began with collaborative development of Masters-level material by a number of European

⁸ <http://www.col.org/progServ/programmes/Pages/VUSSC.aspx>

⁹ <http://www.leche.open.ac.uk/>

distance-teaching and presence-based-teaching HEIs on living with climate change, where the topic embodied in the materials benefits from the many participants. As with TESSA, they have developed the materials first before making them available as OER. The OU again took a leading role and introduced many of the production and quality assurance processes it uses internally. It was then in a good position to pilot the materials as an ODL course, which it is now in the process of mainstreaming. So good project management and agreed processes were key with the prospect of easy reuse being a major incentive to all parties.

Lastly, the openEd 2.0 project is a fully free and open course that has been put together from existing OER by a consortium of European universities where much of the course development was done in the open and was freely visible on their website, and where the course topic was itself related to using online technologies. Currently this is as much about challenging the position of HEIs as providers of higher education as it is about supplementing what HEIs are already doing as in the other two case studies. Similarly there are a number of community-led initiatives trying to do similar things such as the Peer-To-Peer University¹⁰ and WikiEducator, where there are opportunities to co-create content, to teach or support learning or do both and to do so outside of the existing organisational structures.



Conclusions

Higher education institutions are quite open to knowledge sharing in and out of the institution and to collaborating on R&D across institutions. However, they have been less open in the way they operate their teaching practices. The advent of OER promises to change that situation by strengthening the third main element of open innovation – coupled processes – where there is co-creation with (mainly) complementary partners through alliances, co-operation and joint ventures during which give and take are crucial for success (Lane, 2011). There has been some element of coupled processes in higher education whereby one institution may teach another's course or where professional practitioners provide teaching through work-based learning (the facilitation of learning aspect), but OER now enables HEIs and other non-educational organisations in the private, public and voluntary sectors to also be involved in the collaborative development of educational resources for use with larger numbers of students through open and distance learning. Through collaborating they are also able to share cost and effort in the teaching investments they make and/or to enrich or enhance the OER they create. However, all case studies highlight that the issues of clear leadership, careful timetabling and ensuring shared understanding across cultures and languages are critical elements in successful project management.

In some cases such developments are seen as being threats to existing HEIs as the growth in OER and availability of digital technologies apparently makes it easier and cheaper for 'start-ups' to run e-learning or ODL programmes. However, to date the sustainability of such collaborative development is more likely within HEIs that already have capacity to exploit the OER for quality-assured and accredited courses and programmes. It is less certain how free courses can be sustained financially and pedagogically for any length of time.



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