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Open Educational Practices for curriculum enhancement

Abstract

Open educational resources (OER) and open educational practices (OEP) are relatively new areas in educational research. How OER and OEP can help practitioners enhance curricula is one of a number of under-researched topics. This article aims to enable practitioners to identify and implement appropriate open practices to enhance higher education curricula. To that aim, we put forward a framework of four open educational practices based on patterns of OER reuse ('as-is' or adapted), mapped against the processes of curriculum design and delivery. The framework was developed from the in-depth analysis of 20 cases of higher education (HE) practitioners, which revealed patterns of OER reuse across disciplines, institutions and needs. For each open practice we offer evidence, examples and ideas for application by practitioners. We also put forward recommendations for institutional policies on OER and OEP.

Introduction and context

The term open educational resources (OER) was first defined at UNESCO's 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries as

the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes (UNESCO, 2002: 24).

A number of other definitions have emerged since then, including:

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 or 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 (Atkins, Brown and Hammond, 2007: 4).

digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research" (OECD, 2007, p. 133).

teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects the authorship of the work (UNESCO, 2012: 1).

The International Council for Open and Distance Education (n.d.) define open educational practices (OEP) as

practices which support the production, use and reuse of high quality open educational resources through institutional policies, which promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path. OEP address the whole OER governance community: policy makers, managers and administrators of organizations, educational professionals and learners.

Definitions of OER and OEP vary (see Geser, 2012, for a detailed discussion on these definitions). Even without agreed policies, open practices have spread across the higher education (HE) sector globally. Initiatives like the MIT Open CourseWare and Connexions in the USA and OpenLearn in the UK, among others, constitute substantial evidence of the prominence of the OER agenda.

In the UK, we have witnessed a major push and significant investment in the direction of OER and OEP over the last decade, which has manifested itself in the form of many and varied research and development projects (Conole, 2012; Nikoi and Armellini, 2012).

Many of these initiatives have focused on the production and release of resources. The first two rounds of funding released by the Higher Education Funding Council for England (HEFCE) through the Joint Information Systems Committee and the Higher Education Academy since 2008 are prime examples of this approach (HEFCE, 2008). Some initiatives have developed strategies to promote openness and its benefits at different levels (Weller, 2011; Wiley, 2010). Others, such as the Open Educational Quality Initiative (OPAL), have researched ways to support and embed open practices. These initiatives offer institutions policy and practice guidelines along with case studies of institutions at different stages of the OER embedding continuum (OPAL, 2012). The Open Learning Network (OLNET) project addressed a number of research questions in areas such as OER development and effectiveness, barriers and enablers to OER production, business and pedagogical models to support the use of resources, and transfer of good practice (Conole and McAndrew, 2010).

The potential of open content and associated practices to transform the global education landscape has been described as “immense” (Olcott, 2012: 283). However, only a very small proportion of higher education institutions worldwide are involved in publishing OER (Lane, 2012). Research suggests that learners and teachers are not using or repurposing OER extensively (McAndrew et al, 2009).

This article aims to enable practitioners to identify and implement appropriate open practices to enhance the design and delivery of higher education curricula. To that aim, it puts forward an evidence-based framework of four key open educational practices in terms of OER reuse (‘as-is’ or adapted), mapped against the processes of curriculum design and delivery (Figure 4). The framework was developed from the EVOL-OER research project, led by the University of Leicester, UK, between 2011 and 2012 (<http://bit.ly/ur3ZyD>). The framework is presented with

its rationale, examples of reuse of open resources to illustrate each quadrant, and ideas to inform policy and practice.

Structure of this article

The article begins with a discussion on OER use in higher education, with emphasis on the UK university sector. It offers a review of the literature, along with examples from existing practice and from deliverables of OER projects funded in Britain. A brief description of ‘designing for learning’ interventions for academic course teams is then presented, where open practices are encouraged and supported. With patterns of OER reuse becoming apparent in those interventions and the absence of clear, evidence-based models of OER reuse in higher education, a rationale for launching the EVOL-OER project is articulated in the following section: research evidence was needed to establish the extent to which those patterns were an accurate representation of OER reuse in higher education settings. The project is presented in the context of earlier research.

Based on the EVOL-OER project findings, the OEP for curriculum enhancement section puts forward the framework of four open practices in higher education. The framework is accompanied by supporting evidence and examples for each quadrant.

The EVOL-OER project also provided evidence for a number of drivers and barriers to OER reuse, which are listed after the framework. Conclusions and recommendations are presented at the end.

OER reuse in UK higher education

Between 2009 and 2012, the UK Government funded an extensive OER programme, managed by the Joint Information Systems Committee (JISC, <http://www.jisc.ac.uk/>) and the Higher Education Academy (HEA, <http://www.heacademy.ac.uk/>). The funding has largely been allocated to projects that focused on the creation of open repositories and the promotion of a sharing culture among academics in higher education institutions to release their resources as OER.

Limited research has been conducted to investigate the detail of OER reuse by different user groups. The ORIOLE project (orioleproject.blogspot.com/) researched motivation, barriers and concerns around reuse of digital resources. Gruszczynska (2012) looked into OER-related accessibility issues and their relevance to repurposing and reuse. Based on the SONET project (sonet.nottingham.ac.uk/), Windle et al. (2010) identified patterns of how reuse spreads from one institution to another. Wiley (2007) categorised reuse in terms of types of adaptation (e.g., technical, linguistic, pedagogical, cultural, etc).

Hilton III et al (2010) put forward a useful continuum of reuse, showing an increasing degree of openness: *reuse* > *reuse and redistribute only* > *reuse, revise, remix and redistribute*. For

learning and teaching materials to be as open as possible, the authors claim, creators should allow all four 'Rs' in the licence they allocate to the content they produce.

The JISC OER Impact study looked into reuse patterns by staff and students in higher education. It used the image of an iceberg (Figure 1) to illustrate reuse that takes place across an institution. Their findings suggest that there is a small amount of 'visible' reuse of licensed OERs in the curriculum, the part of the iceberg above the surface. The majority of reuse, however, appears to take place below the surface, where staff and students use a wide range of digital resources (not necessarily OER) to support teaching and learning (White & Manton, 2011).

[Figure 1 here]

The OER Impact study also developed the 'Landscape of reuse' framework (Figure 2), which categorised reuse patterns by staff and students into four quadrants: independent, strategic, appropriated and ratified.

In the 'independent' quadrant, staff and students discover and use resources for their teaching and learning activities autonomously. The 'strategic' quadrant comprises tutors who provide students with links to relevant resources via the institution's VLE. In the 'appropriated' quadrant, tutors recommend resources for the same purpose as those in the 'strategic' quadrant, but the resources have been stored on the institution's VLE, rather than linked to. The resources are also likely to be adapted or repurposed for the course or learning activity, rather than reused 'as is'. The above three quadrants involve primarily the use of non-OER resources, which are linked to or embedded into the institution's VLE to support courses – the part of the iceberg below the surface. Only in the 'ratified' quadrant do staff embed properly licensed OER into curriculum – the 'visible' part of the iceberg (White & Manton, 2011).

[Figure 2 here]

Some studies have focused on ways to support academics to engage with OER and OEP. Follows (2012) grouped academics in art and design into four categories, based on their level of engagement with open practices, and developed resources and strategies that help to improve staff engagement with OEP:

- Unaware (novice): academics who never heard of OER or OEP and are unaware of how these concepts relate to them.
- Aware (visitor): academics who look for and use online resources regularly, with little knowledge of OER, but are interested in the ideas of OER and OEP.
- Starter (lodger): academics who are starting to create digital resources using Creative Commons licences and are keen to explore the notion of OEP.
- Resident: academics who use and create OER regularly, contribute to the OER community and support others in OEP for personal and professional development.

Wild (2012) investigated how higher education institutions can support their academic staff to engage with OER reuse. She developed an 'OER engagement ladder' (Figure 3) to represent four levels of engagement with reuse: No engagement, Low (Piecemeal), Medium (Strategic)

and High (Embedded). The author identified three steps that can shift a practitioner from one level to the next: *understanding*, *need*, and *reflection*. The first step includes strategies for building awareness of academics of OER and Creative Commons licences, and developing their understanding of the benefits of using OER for teaching and learning. The second step (need) focuses on fostering course teams' engagement with OER when they come to the stage of designing or redesigning a course. At this point, academics often realise that creating all course materials from scratch may not be an option. The third step that can promote academics' reuse of OER (reflection) arrives when they have received feedback from students on an OER-enhanced module. The more evidence of the positive effects of OER on student learning, the more willing academics will be to engage with it.

[Figure 3 here]

The EVOL-OER project built on the key findings from the OER Impact study by zooming into the 'ratified' quadrant of its landscape of reuse (top-right quadrant of figure 2) and delivered a new four-quadrant framework (Figure 4) to categorise open practices by academics in higher education institutions.

Designing for learning and OEP

Carpe Diem (www.le.ac.uk/carpediem) is a transformational process that develops institutional capability in online learning design (Conole, 2012) by enabling academic course teams to design for effective, participative online learning (Salmon, 2011; Armellini and Jones, 2008; Salmon, Jones and Armellini, 2008). At its heart, is a two-day structured workshop (Armellini, Salmon and Hawkrige, 2009). The 'planner' used in the workshop is itself an open resource (<http://tinyurl.com/cdplanner>).

Carpe Diem delivers a blueprint and a storyboard for the course being designed or redesigned, a set of tested e-tivities (Salmon, 2002) and an action plan for the course team to develop the course further. Carpe Diem's transformative nature has enabled staff and students to capitalise on the affordances of many learning technologies and existing learning resources, which participants integrate into the design and delivery of curricula. Armellini and Aiyegbayo (2010) and Nie et al (2010) provide examples of effective curriculum enhancement resulting from Carpe Diem.

In response to the openness agenda, a resource audit component was successfully introduced into Carpe Diem in 2010 (Table 1). It included strategies for the identification of suitable online material for reuse.

[Table 1 here]

Completing the resource audit table is a highly valuable exercise for course teams: it identifies potentially useful resources as well as gaps. As the resource audit is conducted in a wiki environment, it achieves those objectives collaboratively.

Some Carpe Diem participants had never used open resources before and many were unaware of the variety of repositories available to them. Ownership, licensing and rights are new topics to many participants. Crucially, by completing the resource audit, course teams begin to consider creative ways of reusing and remixing existing material from multiple sources to enhance their course, as well as releasing some of their own content in open repositories. In other words, they begin to consider engaging in open practices.

Data from over 30 Carpe Diem workshops and other learning design interventions for academic course teams at the University of Leicester and across 15 institutions in eight countries since 2010, point towards possible patterns of OER reuse by course teams in curriculum design and delivery, initially captured by Armellini (2011). The resource audit was central in the initial identification of those patterns. Such engagement with open practices required additional understanding and justification. Evidence was needed to identify and characterise the patterns of reuse that HE course teams across the sector displayed in their practice. That was the focus of the EVOL-OER research project (<http://bit.ly/ur3ZyD>).

The EVOL-OER research

The EVOL-OER project was funded by HEFCE through the SCORE Programme (Support Centre for Open Resources in Education, http://www8.open.ac.uk/score/about_SCORE). Its aim was to develop a deeper understanding of the reuse of OER by academics in higher education. It ran from October 2011 to March 2012. The project built on earlier evidence of patterns of OER reuse and developed a characterisation of course design and delivery practices deployed by academic course teams in higher education contexts. EVOL-OER also looked into drivers, barriers and strategies adopted by academics for the reuse and adaptation of open resources.

The research was conducted using qualitative methods. Data were gathered through in-depth, semi-structured interviews with 12 academics who have extensive experience of OER reuse. Ten of the interviewees were from UK-based institutions. Two interviewees were from overseas universities – one in South Africa and one in Nigeria. Seven interviews were conducted face-to-face and five by telephone. All interviews were captured in a digital recorder and transcribed. Data were coded using data-driven (inductive) coding (Boyatzis, 1998) and analysed using thematic analysis (Boyatzis, 1998; Joffe & Yardley, 2004) to identify categories and combining categories into themes. Each of the 12 interviews generated a case of OER reuse.

In addition to the interviews, OER reuse examples and case studies from OER Africa (<http://www.oerafrica.org/>) were selected and analysed. These examples generated eight additional cases of OER reuse. In total, the EVOL-OER study generated 20 cases, covering a wide range of contexts and disciplines (see table 2).

Data obtained from the interviews and OER Africa were analysed in order to ascertain the following aspects of reuse:

- Which subject areas and courses were involved in OER reuse?
- What was the need or motivation to reuse OER?
- What was the purpose of reuse? (for example, short- or long-term enhancement)
- What search strategies were used to identify relevant OER? (for example, which search engines or repositories were used and why?)
- Which types of resources were selected for reuse and in what formats? (i.e. text, pictures, videos)
- How were those resources reused? (i.e. 'as is', remixed, 'tweaked', fully repurposed)
- How were the resources (after adaptation, if appropriate) incorporated into the curriculum and shared back with the community?

Results from the analysis were used to develop the 20 cases, illustrating each of the four types of open educational practices for curriculum enhancement presented in the next section.

OEP for curriculum enhancement

The evidence from the EVOL-OER project points to two different forms of OER reuse by practitioners for the purpose of enhancing the curriculum: 'as is' and repurposed. By mapping both forms of reuse against curriculum design and delivery, we obtained the four open educational practices shown in Figure 4.

Each of the 20 cases falls into, and provides evidence for, one of the quadrants of the framework (Table 2). This section characterises each practice and, via concrete examples derived from the research, provides insights into how practitioners might apply the framework in their own practice. The examples have been adapted from 'Examples of OER reuse', one of the outputs of the EVOL-OER project (see <http://bit.ly/S1JEW2>).

[Figure 4 here]

[Table 2 here]

The four open practices

Quadrant 1: OER used 'as is' during curriculum design: planned enhancement.

The course team identify suitable resources, which they incorporate unchanged into the curriculum as it is being designed. These resources, which are licensed for reuse, are integrated in a planned and structured way, but undergo no adaptation.

Example: An English Language Teaching Unit in a British university runs many in-session courses for international students who have registered on degree programmes. These students want to improve their academic writing. Open research articles are used, with no adaptation, to demonstrate what constitutes good academic writing. Reusing this material 'as is' maintains the integrity and authenticity of the resources. Tasks were

designed around the selected content. For example, keywords were taken out from a paragraph and students were asked to put those words back in during a teaching session.

Quadrant 2: repurposed OER in curriculum design: strategic enhancement.

As quadrant 1, but the course team adapt or repurpose the material prior to incorporating it into the curriculum during the design phase. Although time-consuming, this approach is beneficial in that it offers opportunities for contextualisation and customisation of OER for the longer term.

Example: An agricultural college in Malawi developed a Communications Skills textbook by repurposing multiple open resources. The textbook was formally embedded in the institution's curriculum. It has been subsequently reused and adapted by a Nigerian university for the development of its own textbook for a trade union leaders course. This new textbook included many sections taken from the original textbook: some unchanged, some slightly adapted and some extensively repurposed and contextualised to benefit the new target audience. It also incorporated new materials adapted from other open sources.

Quadrant 3: unchanged OER used during delivery: just-in-time enhancement.

With the course in progress, the tutor or course team realise that students could benefit from specific resources, which are incorporated unchanged into learning and teaching activities. Many of those resources are found accidentally by staff and sometimes by students. This form of opportunistic, just-in-time enhancement was common in the EVOL-OER research: it adds variety and provides tutors with an opportunity to plug emerging gaps during delivery, at a marginal cost.

Example: YouTube videos and TV documentaries are used to update and maintain the currency of the teaching material on a Sociology module at a British university. They are also used to increase learner engagement with the course. Links to these materials are provided via handouts and slides, used in class and uploaded to the virtual learning environment.

Quadrant 4: repurposed OER added during curriculum delivery: reflective enhancement.

Similar to quadrant 3, but the new resources are modified or repurposed as a result of a need or gap identified during curriculum delivery. By adapting the material in advance, the course team can ensure a better fit between the new resource and the delivery of course, with the latter already in progress.

Example: In the Staff Development Unit at a university in South Africa, open content and the sharing of good practice across the institution are heavily promoted. Workshops and seminars, in which open resources feature prominently, are regularly offered to staff members from different faculties, often at short notice. The unit assists academics by identifying OER in different subject areas from a range of repositories, and by compiling relevant resources in the form of presentations, which they deliver to staff members.

Reuse strategies during the delivery phase of staff development sessions are highly reflective: they include the careful adaptation of original material to ensure it is suitable for the African context, remixing materials from previous presentations (which themselves are available openly) and adding new content.

The four-quadrant framework shown in Figure 4 and the resource audit tool shown in Table 1 can be easily adapted by institutions and used in learning design workshops (such as Carpe Diem) and staff development courses. The framework raises awareness of the different types of open educational practices, supported by research evidence and practical examples. The resource audit tool enables course teams to identify what resources are already available to reuse and repurpose, and where the gaps are. Tutors can subsequently decide on what material needs adapting or developing from scratch at the different stages of design and delivery.

Data obtained from the EVOL-OER project were also analysed to identify drivers and barriers for the reuse and adaptation of OER by academics. The key findings are reported in the next two sections.

Drivers for OER reuse

Improving the quality of teaching material by reusing OER was a key advantage according to the data. Higher quality may be achieved through the use of:

- copyright-cleared materials
- resources created by recognised institutions
- resources that have been evaluated with students
- up-to-date material to maintain the currency of content
- resources developed for other subjects or disciplines.

Opening up new approaches to teaching and learning was mentioned as another driver for OER reuse. The positive impact of OER on participants' practices in Art and Design is shown in the following quotation:

Subjects in Art and Design are very practice-based. Teaching and learning is traditionally done physically in a studio environment. With video OER showing students the arts processes, students can watch them before they come to the studio. Students can then discuss their ideas during the practical sessions rather than focusing on learning the processes. Using OER has opened up new ways of interacting and engaging with students in the studio environment. (UK_HE_Arts and Design)

Access to resources previously not available was highly valued by African institutions. However, this challenge is not unique to the African context. In the UK, there was also a

perceived lack of resources in certain educational sectors such as Further Education, as also evidenced in EVOL-OER.

Barriers to OER reuse

The lack of technical and digital literacy skills has been identified as a key factor affecting practitioners' ability to adapt resources, especially multimedia OER, for subsequent reuse. Academics' limited understanding of copyright and licensing issues has been reported as another key barrier to OER reuse. EVOL-OER interviewees indicated that using OER had "challenged years of practice", described the process as a "totally different way of thinking", which they found "daunting and overwhelming". (UK_FE_Criminology)

Saving time was the main reason why some of the interviewees opted to reuse OER. However, they expressed doubts about whether reusing OER actually achieves this. The significant number of OER available in certain subjects (in many cases ready to use 'as is' or with minor changes) suggests that academics can incorporate them and deliver rapid, just-in-time enhancement to their courses (Figure 4, quadrant 3).

In general, searching for OER was considered time-consuming. The lack of OER in certain subject areas was highlighted as a major barrier. Searching across a number of repositories using a variety of search strategies takes time. Identifying an OER that aligns well with the learning objectives may also be difficult. In some cases, significant time was invested in adapting the resources initially identified. How this process compares with creating resources from scratch was unclear from the experiences of those interviewed.

The availability of resources in formats that are easily and legally customisable is very important for users. The evidence suggests that some OER contributors release their materials under restrictive licences. Although a full discussion on licensing options is beyond the scope of this article, the use of the 'no-derivatives' option, for example, prevents others from modifying the material in any way, and therefore constitutes a barrier. Some authors make OER available in formats such as PDF or Flash, which other users cannot easily edit.

The size or granularity of resources is an important consideration for reuse. OER that are smaller in size (i.e. higher granularity) are seen as more suited for reuse, as they can be quickly and more easily incorporated into existing teaching materials, across all quadrants of the framework.

Conclusions

This paper has put forward a framework of four open educational practices to enhance HE curriculum design and delivery through the reuse of open educational resources. The framework may be helpful in enabling higher education practitioners to identify and implement appropriate open practices to enhance the design and delivery of curricula. The EVOL-OER project provided the evidence and a rationale for practices observed during more than 30 Carpe Diem learning design workshops in many different disciplines, at eight universities over two-and-a-half years.

The evidence suggests that higher education practitioners are generally willing to engage with open practices through the reuse of open educational resources to enhance the design and delivery of curricula. They appreciate the benefit that such practices can deliver to themselves, their students and other user groups. These open educational practices fall into different areas, which we have presented as a four-quadrant framework (Figure 4): *planned* and *strategic* enhancement (during the curriculum design phase); *just-in-time* and *reflective* enhancement (during curriculum delivery).

The drivers and barriers identified in EVOL-OER may inform the way institutions approach their OER and OEP policies and provide possible reasons why higher education practitioners do not reuse OER extensively. Developing relevant skills in digital literacy and open practices in staff is critical for OER to be taken up at all levels within an institution. Systematic support and training for academics, focusing on evidence and added value for students and themselves, is central to the development of a culture where open practices are prominent. Such support, both as users and contributors of OER, should cover the following key areas:

- Identifying relevant OER repositories, especially those containing subject-specific OER, and sharing the benefit of using them through appropriate channels
- Providing guidance on conducting OER-related research effectively
- Developing technical skills in staff, especially in relation to creating multimedia resources in and editing multimedia material created by others
- Developing a deeper understanding of copyright and licensing issues
- Providing guidance on creating OER in appropriate formats and sizes to make the resources reusable by others under suitable licences
- Embedding the above in institutional teaching and learning enhancement programmes
- Enabling a community of OER practitioners to operate and share their work across the institution.

The EVOL-OER research project may help us better understand why, how and when academics reuse OER and how, in doing so, their open practices develop. The cases generated by the project identified and illustrated both the advantages and the limitations of each practice within the proposed framework. We invite the community to adapt and apply this framework, gather additional evidence and report back via the corresponding author.

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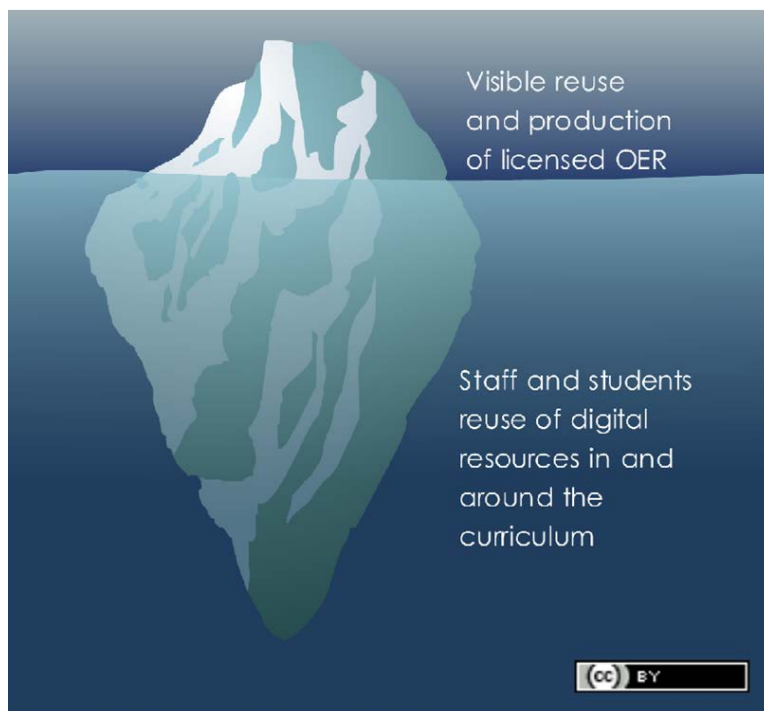


Figure 1: Visible and invisible reuse in higher education

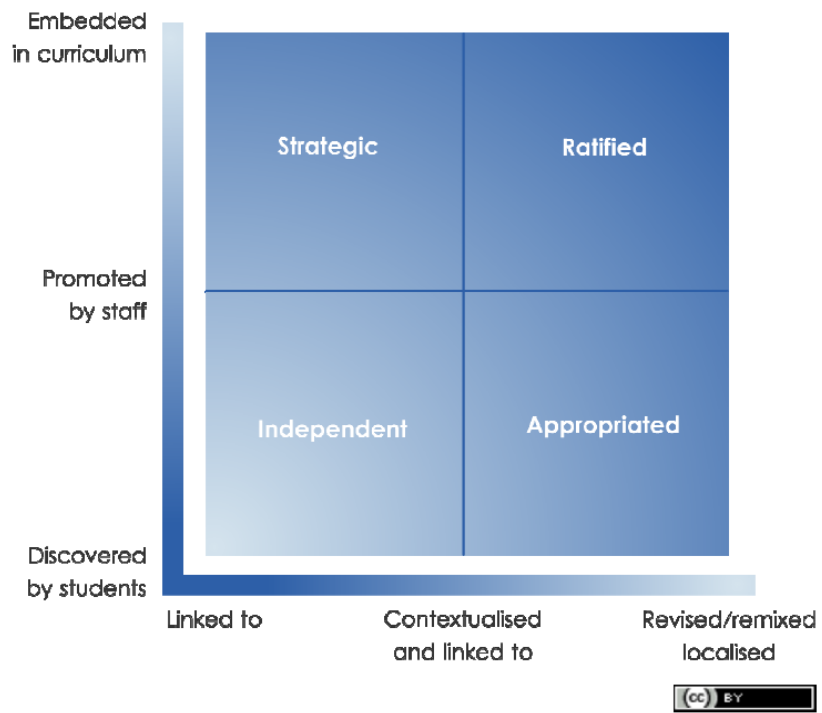


Figure 2: The landscape of reuse (White & Manton, 2011)

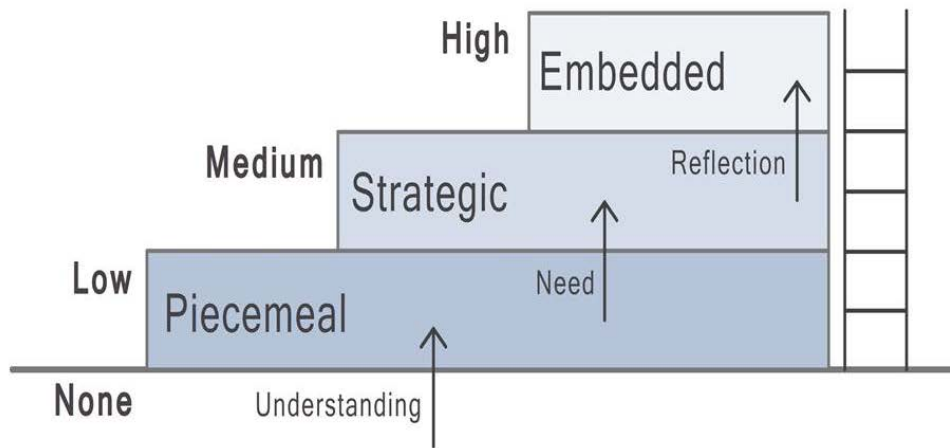


Figure 3: The OER Engagement Ladder. ©2012 Joanna Wild, University of Oxford, CC-BY

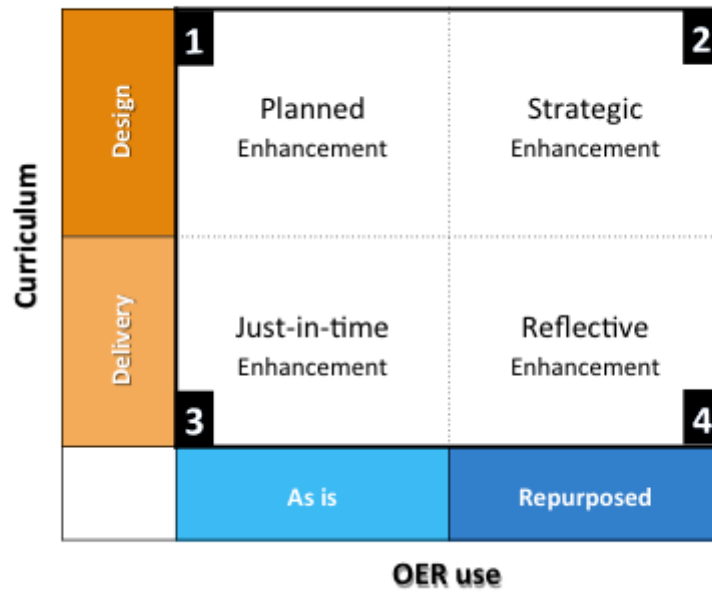


Figure 4: Four open educational practices for curriculum enhancement during design and delivery

	Format				
Content (under appropriate licences) ↓	Text & graphics	Audio	Video	Slides (e.g. PowerPoint)	Other (e.g. Adobe Presenter, Flash)
What I've found and can reuse <i>as is</i>					
What I've found, can tweak and use					
What I've found but must repurpose for use					
What I need to create for this course					

Table 1: Resource audit

Table 2: EVOL-OER evidence sources mapped against the quadrants of the framework

Quadrant & type of enhancement	Evidence source		Disciplines involved
	In-depth interviews	OER Africa examples	
1. Planned	4	2	English Language Teaching, Study Skills, Maths, Medicine
2. Strategic	4	4	Communication Skills, Teacher Education, Maths Education, Lab Skills, Art & Design, Nursing, Sociology
3. Just-in-time	1	2	Sociology, Aquaculture, Teacher Training
4. Reflective	3	0	Staff Development, Criminology, Law