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

The reuse of OER in health and life sciences: a check-up

Dr Vivien Rolfe[1], Jacqueline Williams[1] and Dr Richard Windle[2]

[1]DeMontfort University and [2]the University of Nottingham

Outline

The higher education (HE) health and life sciences audience is one of the largest sectors in the UK with most institutions offering health and life sciences programmes, often with large numbers of students enrolled. Around one-fifth of students at university study a subject that falls under this umbrella (Medicine JACS Group A, Subject Allied to Medicine Group B, Biological and Veterinary Sciences Groups C and D). One in ten students alone study a subject allied to Medicine including Nursing, Midwifery, Pharmacy and biomedical sciences, with around 50,000 accepted applicants in 2011 (UCAS, 2012) out of a pool of almost 500,000 total accepted university places in the UK.

The range of subjects is wide, and departments and faculties often teach common subjects such as Biochemistry, Anatomy or Physiology separately across a number of life sciences degree programmes. Within a large HE institution, therefore, it is not inconceivable that a subject might be covered hundreds of times a year. So the potential for reuse of educational resources is massive. On a global scale, the potential is even larger, with duplications of training of undergraduates and healthcare professionals. A quick web search of hand hygiene resources highlights the fact that most organisations are creating their own resources in this area, essentially reproducing the same materials over and over again, when sharing and reuse could offer both a route to efficiency and to allow the best resources to be shared. However, this potential magnitude may cover up a dearth of high-quality training materials. In Midwifery, for example, there is a nationally recognised requirement for better career promotional materials for prospective students nationally and internationally (Department of Health, 2010).

The context of health sciences education is wider than HE level. In particular, the fact that most health sciences courses are vocational offers an interesting opportunity for OER reuse. Since all healthcare professionals have a career-long requirement for training and need to keep up to date with knowledge by interacting with resources, this provides a vast potential for cross-sector sharing of resources with secondary audiences including both registered and unregistered professionals (Health Professions Council, Institute of Biomedical Science, Nursing and Midwifery Council and many other professional bodies). How much are OER resources breaking out from the formal educational institutions into other health settings and what does this tell us about the nature and potential for OER? These are some of the questions that we hope our case studies will illuminate.

Finally, health sciences, perhaps more than any other subject area, has the opportunity to engage the wider community in the sharing and reuse of resources. Patients, services users, carers, charities and support groups form an important secondary audience for these resources and also a potential source of user-generated content. Everyone has a vested interest in their own health and that of their friends, family and community. In this era of the expert patient (Greenhaulgh, 2009), now more than every there is a need for high-quality reliable information on health that can be accessed and is accessible for all.

So theoretically the concept of Open Educational Resources (OER) and moving towards cultures of open practices and sharing should be fundamental to the future of health and life sciences education at all levels, but it is not without its challenges. These include institutional barriers to sharing such as NHS firewalls and lack of co-ordination of IT systems between education and care

providers. There is also a lack of familiarity or confidence with IT in the culture of some of the professional groups included.

In these case studies we will discuss three examples where HE institutions have developed health and life sciences resources and are releasing them as OER for cross-sector reuse. We will discuss emerging themes and make recommendations for the health-OER community.

Case study

Case study 1: the TIGER (Transforming Interprofessional Groups through Educational Resources) repository

Interprofessional education (IPE) remains an emerging field within health and social care curricula (Barr and Ross, 2006). The TIGER (Transforming Interprofessional Groups through Educational Resources) repository was developed to provide open resources for interprofessional education. On release of the repository, proactive work was needed to ensure that healthcare staff in practice were made aware of the repository so that materials were accessed, the repository expanded and materials did remain static. The SCORE Fellowship enabled the use and impact of the TIGER interprofessional Open Educational Resource repository by healthcare professionals in the UK. A variety of teaching and learning methods and techniques have been used in the project.

The SCORE-supported project had three key elements to it. Firstly, ten UK-wide practice IPE champions were identified and supported in the use of the interprofessional repository with their staff. Secondly, data were collected about the use of the repository by the champions and how they evaluated the materials within the repository. They were proactively encouraged to download repurpose and upload transformed materials to the repository. Thirdly, this was compared with data on the usage of the repository including both downloads and uploads. Champions were sought through a variety of ways namely, through the Centre for Advancement of Interprofessional Education website, conference presentations, direct approach and response to enquiries about Open Educational Resources.

None of the champions had any previous experience of using OER, although some had been facilitating IPE for some time. There seemed to be a misunderstanding between learning objects that were open to view and download and resources that could be repurposed and reused under a Creative Commons licence. The experienced IPE facilitators were interested in the opportunity to access new materials with the view to updating their resources and trying some new methodologies and exercises. The champions reported that they disseminated the information about the TIGER repository to colleagues within their institution. However, the two key contacts who have had the most impact on the direction of the TIGER project have been made as a result of a direct approach. These contacts are from outside the UK, Ireland and Afghanistan, and had reported to have an urgent need for OER for continuing professional development activities with their staff. Both champions have required guidance on how to access the repository and how to use the materials. They identified that they wished to engage with OER in health and social care and have been supported in their use. This is leading to partnership arrangements so that bespoke materials can be developed and released.

This raises a key question of ongoing engagement with the repository to ensure that materials remain contemporary and evidence-based. It could be argued that OER should be embedded within a live curriculum so that there is a clear mechanism for updating as required. This is particular important in health and social care so that practice is evidence-based and meets current guidelines and accepted practice. This raises an additional question of contributors taking ownership of their released materials so that they can exchange them as required following update.

The TIGER project is an excellent example of how in the current economic climate health and social care interprofessional teaching materials are accessible, adaptable and innovative which will both enhance the learning experience as well as being an excellent way of disseminating best practice in health and social care. The resources are now available on the worldwide web, freely available, so that healthcare professionals, in particular, can use them for their continuing professional development. It is essential that the resources remain contemporary and reflect the current evidence base. Is it important to say if they are in standard OER repositories such as Jorum, and, if not, why this decision was made? I think it is quite informative and fits with our findings about the use of local repositories being more successful. This links into community and partnership.

It is recognised, however, that while the materials are developed within the UK they will be accessed and used around the world. Therefore their release under a Creative Commons licence very appropriate as it allows the end user to adapt them for the local context. Additionally, OER require both internet access and high enough speeds to download materials. While this is being addressed in many areas equity of access is still not possible in many countries around the world.

While international or cross-cultural reuse appears to be a growing area that is overcoming some of the barriers outlined above, ironically within the UK a key problem still exists in allowing healthcare professionals access to open materials due to the nature of IT security systems, such as NHS where firewalls prohibit access to certain websites.

It is anticipated that the relationships will continue with the champions beyond the Fellowship as the individuals begin to relook at and update their resources for their teaching in future academic years.

Case study 2: What happens when we give away the 'best silver'? Reuse of resources from a mature health-OER repository of media-rich learning resources

This case study is based on the development, use and reuse of multimedia learning objects that have been released as OER over a period of approximately ten years. While created for use within the host institution, a decision was made early in the project implementation to make the resources openly available for free reuse for non-commercial purposes, at a time when Creative Commons licensing regimes were not available initially. Each resource has been linked to an online feedback form that has collated evidence of its reuse from the time of its release. This case study is based on an analysis of these data and data collected more recently from this mature community of reusers.

Project initiation and history

In looking for a format to support the learning of Nursing students, the School of Nursing, Midwifery and Physiotherapy at the University of Nottingham undertook early experiments with multimedia learning objects. These initial experiments were triggered by the emerging literature that showed the effective of visual, interactive learning for healthcare students and the literature that showed that such students responded well to materials with a high-level of granularity (Wharrad *et al.*, 2001). This so-called 'just in time' learning was also seen to be highly effective for healthcare students (Lymn *et al.*, 2007; Windle *et al.*, 2010). The work was also driven by the evidence of the effectiveness of learning objects from other subject disciplines.

Furthermore, the ideas were spurred by the early notions of sharing through the so-called 'Learning Object Economy' (Campbell, 2003) with its promise of shared costs of resources and shared reuse. Initially it was thought that the media-rich learning resources would provide a point of additional value to our courses, but we, like many others came to recognise their value in other ways – as marketing tools and as vehicles for research and collaboration. Therefore a decision was made to release the resources openly. This was prior to the mainstream OER movement and some saw this move as akin to giving away the 'best silver'.

In a further development the group at Nottingham became part of one of the HEFCE-funded Centre for Excellence in Teaching and Learning (CETL) projects for reusable learning objects (RLO) (RLO-CETL, Boyle *et al.*, 2007). At around this time the Creative Commons licence[1] was being developed and this was adopted as the licensing framework for the project. The CETL project ended in 2010, but much of the work of the RLO-CETL at Nottingham in the area of health sciences has been assimilated into the growing field of Open Educational Resources.

The case study

This case study relates to the reuse of the resources over the decade for which we have been creating and releasing health-related RLO as Open Educational Resources. Currently, approximately 200 such resources have been released (HELM: Health E-learning and Media[2]). The case study is based on evaluative data from the reuse community who have accessed these resources. From the time of their release, each resource was attached to a short feedback form requesting data from the reuse community. A comparison with samples of tracking data has suggested that a feedback response of approximately 1-2%. Respondents are asked to rate the usefulness of the resources. Over 95% of the reuse community rated the resources as 'excellent' or 'very good' for their purposes, and this was higher than that reported even in the groups for whom the resources were created (Windle *et al.*, 2010).

As part of the survey, respondents are invited to provide details about location and email address if they would be prepared to provide more detailed feedback about their use of the resources. From this data reuse maps have been constructed. Examples of these maps can be seen at the School of Nursing Education Technology group (SONET, 2010). Reuse has been reported in a wide range of countries throughout Europe, the Middle East, Africa, Australia, North and South

---

[1] http://www.creativecommons.org
[2] http://www.nottingham.ac.uk/helm

America and Asia. Reuse is reported from a range of institutions including universities, further education establishments, schools, colleges, health trusts and organisations, charities, support groups and by individuals.

In an attempt to learn more about reuse of resources within health, a second questionnaire dealing specifically with reuse was constructed and sent to all of those who had indicated that they would be willing to provide feedback. The reuse question set was developed using the parameters of use allowed under the Creative Commons licence. The main categories were use, sharing, adaptation, wider impact and characteristics that supported reuse. A full version of the questionnaire can be found at: http://www.zoomerang.com/Survey/WEB22E5R4UG7GP/.

Findings

The first section of the report asked about reuse of the resources. Most respondents identified themselves as students or lecturers in HE or FE. However, a significant number identified themselves as healthcare practitioners, suggesting that cross-sector reuse of OER in health is occurring. Service users and carers only represented a small proportion of reuse, but this might also reflect the reticence of this group to identify themselves. The questionnaire asked respondents if they had shared or distributed the resources to any other groups of individuals. Resources had been shared with many different groups and stakeholders in the healthcare setting. Learners were the group with whom the resources were most commonly redistributed, followed by 'educators'. Healthcare professionals again featured significantly at 25%. At a lower level of around 5-10% resources were still redistributed to those identified as patients, service users and carers, again suggesting that the resources were having some impact in the wider community.

In relation to how the resources were located, the most popular route was 'by a general web search'. In contrast OER portals or specific searches remained a rare route of access. Similarly most reusers continued to access or download the resources from the host site rather than from specific OER repositories such as JORUM and UNOW. There was very little use of more technical solutions such as RSS feeds. Targeted health-related websites and websites provided by NHS were also a popular route of access, suggesting cross-sector reuse was also functioning here. While many of the reusers were one-off reusers, about a third suggested that the discovery and use of the one resource had led them to explore and access other resources, with their relationship with the repository most often growing steadily over time.

Over 99% of individuals stated that they had not made any changes to the resources, but had used them as they were. This might reflect the nature of the resources, but also suggests that individuals were able to use the resources effectively as they were without the need for adaptation. This might relate to the purposeful level of granularity of the resources, or the fact the reusers did not want to interfere with their integrity. While not asking specifically about contextualisation, the results suggest that reusers were using other means to build context: When asked what were the most important characteristics of the resources that support reuse, the main response was 'level of the content'. This is important as one of the major underpinning drivers to the development of the resources has been the community-based approach and one of the main reasons for adopting this approach has been the potential level of alignment between the actual learning needs of students and the resources created that this can facilitate. While we know that this alignment with learning needs functions to support the learning of the user groups

(Windle *et al.*, 2011), the results gained here suggest that it goes much further in supporting the learning needs of reusers and their stakeholders. The factor rated the second most important was quality control. Again this is a very significant finding as it shows the importance of quality assurance at the point of release to OER reuse. Quality and quality assurance is often a controversial issue in OER, whether it should be carried out by the releaser or managed entirely by the reuser, but here it appears that the issue of quality assurance was a major driver for reuse.

The questionnaire also went on to look at the wider impact on health-related reuse. Firstly respondents were asked whether they had created any resources of their own. After accessing the OER released in this project, over 50% of respondents suggested that they had gone on to develop some resources of their own since accessing the resources on the SONET/HELM site, suggesting a greater impact of this OER project than simply reuse of the actual resources, with a tangible impact on wider academic practice. This was a wide and eclectic range of materials varying in content, level and format. However, significantly only 17% of respondents had gone on themselves to release these materials openly for reuse. It should be noted that some of the resources that have been created by the reusers in this study have themselves been reused within our courses, or individual reusers have since collaborated with us to create new resources that we have shared. This shows the completion of an OER circle or 'life cycle'.

Case study 3: Developing and sharing OER in the health and life sciences

The Faculty of Health and Life Sciences at De Montfort University has been involved in releasing Open Educational Resources since 2007. Three major projects have included: 1) Virtual Analytical Laboratory (VAL) – OER supporting students in gaining basic laboratory skills; 2) Sickle Cell Open – Online Topics and Educational Resources (SCOOTER) – resources supporting the education and awareness of the blood disorders sickle cell disease and thalassaemia; and 3) Health and Life Science Open Educational Resources (HALSOER) extending the release of life sciences and physical sciences resources by linking a number of undergraduate programmes (Medical Science, Midwifery, Forensic Science) with external partners and publishers. Through these projects staff and student engagement with OER continues to grow and the institution is seeing a cultural shift toward more open working. In a survey of University staff in 2009 only 18% of staff were aware of the term 'OER' (Rolfe, 2012) and in a repeat of this survey in 2012 awareness had grown to 50% of University staff who responded (n=102 respondents, unpublished data).

My individual SCORE Fellowship aims to build existing laboratory skills OER into 'open courses', but this case study reports on the challenges and successes of discovering and reusing OER in health and life sciences, making recommendations for both users and sharers.

Discovering Open Educational Resources and courses

The approach adopted for this fellowship included a review of existing laboratory skills OER so to reuse and repurpose existing content where possible. A search strategy was drawn up, and known repositories such as Jorum (http://www.jorum.ac.uk) and file-sharing websites such as YouTube (http://www.YouTube.com) were searched. There seems to be a growing trend for 'open courses' as highlighted by the success of the Kahn Academy (http://www.khanacademy.org/), which offers bite-size chunks of learning on a wide range of subjects. The limitation of services such as these is

that the content is not easily adaptable and is not available in a range of technical format, so the level of openness and accessibility to learners is limited.

From research looking at staff attitudes toward OER it is clear that discovery is we know that discovery is a challenge and academic staff awareness of national repositories and science collections was low in 2009 with only 20% of those responding to a survey having heard of Jorum (Rolfe, 2012), although this had risen to 33% in 2012, which still seems low (Rolfe and Fowler, unpublished data).

Technical barriers to reuse and adaptation

Upon retrieving OER from Jorum there are then technical challenges. Often materials are available as a SCORM package to facilitate uploading to a content management system. Many of these OER have no instructions of how to use them and the individual assets are not retrievable. A series of multiple-choice questions on laboratory skills looked useful, but there were more technical barriers since I did not have access to the QuestionMarkPerception system, so could not repurpose the questions as the licence was permitting me to do so. I think the consideration of 'open' in relation to technical aspects of resources is something that has largely been overlooked.

The OER community has spoken of a healthy 'OER life cycle' enabling users to discover, use and adapt, and share back their derivations (Yergler, 2010). Others have spoken about the need to consider technology requirements including asking the question whether the user has the editing tools, technical expertise and has access to original source files (Hilton III *et al.*, 2010). Through writing this case study exercise it is clear there is no consistency in sharing OER via the web and where and how to search, and there is little consideration for technical ability of the user and their access to software and or expertise to reuse and adapt material.

Achieving open and discoverable OER

The approach taken on our three OER health and life sciences projects (VAL, SCOOTER, HALSOER) was to aid discovery using online marketing, hosting OER on search-engine optimised websites alongside other repositories (Jorum, MERLOT). OER are shared via the sites and RSS feeds, and publicised using social networking. This approach helps build communities of users, which are an important component of ensuring that OER activity is sustained and encouraged (Downes, 2006). Our OER reach over 1000 global visitors each month, although in this way, we are not targeting our audiences, and these are members of the public, informal learners and educators or business services interested in our materials.

We strive to produce truly open and accessible materials by publishing in multiple formats. This is not as time-consuming as it may seem: a Word document can easily be saved as a PDF. A Flash animation can be quickly stripped of buttons and interactive elements and published as a video file. This approach was adapted from latest online marketing techniques, which look to produce many different modalities from one content source in a systematic way (Williams, 2011), and for our purposes is a good model for widening the interoperability and accessibility of OER, and by producing multiple file formats this gives users a technical choice of which format to use and repurpose.

A word about open courses

As open education builds momentum we are gaining a picture of what users want. Do they really want to adapt and repurpose? Do they want the OER assets or building blocks, or do they want ready made short courses? My individual SCORE Fellowship will report on the use of open courses using Moodle as an open content delivery platform and explore the use of Apple and Android books and magazines for distribution of resources and courses.

Learning from OER

From this case study seven key themes have emerged:

Cross-sector sharing in vocational subjects

The results suggest that where the conditions are right health-related OER can break out from its traditional boundaries in HE and begin to have a wider impact in the health community. This was particularly evident from the fairly robust reuse occurring with healthcare professionals in case studies 1 and 2 and the fact that many of the routes for sharing and discovery were embedded into the working practices of these groups, such as the use of NHS websites for finding, hosting and sharing resources (case study 2). Users and carers may have some part to play in reuse albeit at a lower reported level, but this might reflect the extent to which they wished to be identified in this survey. However, a word of caution must also be expressed here. While complex technical solutions to OER distribution and discovery such as repositories and RSS feeds are being created, these are not playing a significant role in the reuse identified in this case study. Indeed technical issues were highlighted as barriers to reuse that had to be overcome in all three case studies. Case study 3 took the approach of searching for the resources for the reuse audience and making these accessible. More traditional and familiar routes of discovery such as general web searches and traditional weblinks are operating as the main routes for the groups here (case study 2), and it was evident that potential reusers in the healthcare community had little knowledge of OER prior to being offered resources from these projects. Therefore, there is a need for the OER community to fully engage with these routes for access and dissemination and not succumb to the danger of becoming a closed community by practicality as a result of our own structures, language and mechanisms. What these case studies highlight is the need for the OER community to reach out into the 'real world' to where these wider reuse audiences within health sciences are actually operating if we really want to have an impact.

Building partnerships

The release of OER for health and life sciences developed within UK enables high-quality materials to be accessed, adapted and reused globally. This was evident in all three case studies and highlighted by the mapping work that has been undertaken in case study 2. This will potentially lead to the development of partnerships with a range of external agencies that have less OER experience and require further support and advice in their use. It also provides opportunities to release materials to meet the needs of the partner so that learning objects that are really needed are developed and released rather than resources duplicated. Inevitably resource issues need to be explored as once UK-funded projects such JISC have ceased; institutions require funding in

order to progress this work and support external agencies in their requests. Therefore, it is likely that the partnerships will need to be formalised within an external income-generation contract.

Importance of community

The role that community plays in any successful attempts to share resources in a sustainable way has been highlighted previously in relation to repositories (Douglas *et al.*, 2007), but these case studies highlight the continued importance of these factors in relation to OER. The importance of community and relationships again came across clearly from the case studies reported here. Interpersonal relationships as routes of discovery, recommendation and validation remain powerful drivers for reuse. In case study 2, about a third of individuals surveyed appeared to create a community association with the repository in question allowing use of the resources to grow over time. While the work of Wenger and others on 'Communities of Practice' suggests that communities cannot be forced (Wenger *et al.*, 2002), case study 1 highlights how proactive steps can be taken to support communities and build these around repositories. Likewise case study 3 shows how active steps can be taken by the OER community to foster discoverability in communities outside of those who are currently engaged in OER reuse. Both case studies 1 and 2 suggest that relationship, trust and sense of control or ownership are essential qualities of an OER reuse community. Therefore while many advocate a laissez-faire approach to OER, mechanisms could be put in place to support the community aspects of reuse and sharing, but this must be done carefully so as not to harm the delicate sense of control that the community displays.

Wider community, responsibility and decision making

The potential for reuse of health-related OER resources by the wider community has been discussed above and examples of this can be seen from the case studies. However, the extent to which reuse extends outside the professional community to service users and carers is at this point still unclear and further work is required to fully understand the impact of OER in these groups.

The fact that educational resources may be accessed and used by the wider community in health raises some important and potentially difficult issues. When considering sensitive patient data and information, there are difficult decisions to consider when choosing to release an OER. The extent to which individuals consent to have their information, experiences or images released in a way that means they become part of an ongoing OER process is still largely unaddressed. Furthermore, what responsibility do those releasing OER have for the types of materials that are accessed? The authors all have examples of emotive subjects such as critical illness or bereavement that have been captured in resources or of specialist educational pathology slides, on sickle cell disease for example, that have been created for use by formal learners in a supportive learning environment. How much self-censorship should OER releasers undertake on such materials? Who makes these decisions? Should items be released with guidance on how to use resources and what they might contain? This is contradicting the open philosophy of sharing knowledge.

Power relationships

It could be argued that the release of OER in health and social care could have the most impact in areas in the world that have difficulty in accessing high-quality materials. For example, literature reviews have sourced very little OER in midwifery and the International Confederation of Midwives have confirmed this (Personal communication, 2011). However, education and training is needed to reduce both maternal and neonatal mortality and morbidity in many emerging countries. Wiley (2007) argues that in some cultures learning by doing and making mistakes is normal practice. This is not helpful for healthcare where mistakes can cost lives and affect lives long-term. UNESCO argues that there is a consensus that OER can benefit universities in developing countries, although there has not been much focus on the developing countries' particular needs and requirements. Case study 2 showed clear examples of resources being used in over 20 countries worldwide. These countries included many such emerging countries.

Larsen and Vincent-Lancrin (2005) remind us that most people will develop OER altruistically so that the materials can be adapted by others, modified and even improved them. There are some who would argue that release of all these materials amounts to nothing short of imperialism (Johnstone, 2005). Santos *et al.* (2010) argue that OER release is dominated by institutions that teach in English and promote their own cultural and educational models.

Nevertheless, it could be argued that within healthcare these views should be challenged as the broad goals and aims for health and the major risks to global health is the same for worldwide healthcare (WHO, 2009). Where there are deprivation and high rates of mortality there is an urgent need for education resources to support training of local healthcare workers. Open educational resources could provide a solution to these ongoing problems. It is recognised that materials will need to be contextualised, but OER can provide a key advantage to provide materials for countries that do not have the funding or resources to develop their own from scratch. What was evident from these case studies is that most of the reuse occurred from non-adapted materials, as seen in case study 2. Therefore, it may be assumed that educators are finding means to build the context around the OER resources that are being reused.

Case studies 2 and 3 discuss the concept of the OER cycle where the release of materials by the initiator institutions leads to reuse by others who eventually develop their own resources and these secondary creators release these back into the community for reuse by others including the initiator institution to its enrichment. This model is akin to the concepts of the learning object economy from the last decade (Campbell, 2003). What is perhaps different here is the fact that the secondary users can come from a very broad set of environments within healthcare, including professionals and patients. While examples of such creation are evident from the case studies, what is also clear is that completion of this cycle is still relatively rare at present (see case study 2). However, given time the completion of the OER cycle may help to reduce claims of imperialism by those in the developed OER world as we move towards a greater climate of equal benefit.

Repurposing

From these case studies, it is clear that reuse of health-related resources is occurring, but how much repurposing is going on and whether this is important is less clear. There are many technical barriers to repurposing OER, alongside simple infrastructural and policy barriers; for example, firewalls and barriers to using PCs in hospitals. The lack of adaptation of health-related OER may

reflect a number of different issues and has been anecdotally discussed in many OER fora. It might be that the health-related OER that individuals wish to reuse tend to be more media-rich resources that include images, video audio and interactivity. Given the nature of many of the subject areas encompassed within health sciences, such as Anatomy, Pathology or Clinical Skills demonstrations, this might not be surprising. However, there is also a sense that using OER at the point of origin rather than repurposing and redistributing may prevent the danger of resources going out of date or being adapted away from the robust or accurate content included in the original. Under the 'SA' licence there may well be multiple versions of one resource with quite varying content. How are all of these to be updated? Moreover, if attribution is a required factor in the licence then an individual may find that they are being attributed on a resource whose content has been modified into something less than accurate, possibly advocating unsafe practice.

There clearly are considerations to be met to ensure OER are technically open and accessible, and downloadable for non-PC users. Releasing materials in multiple file formats is one simple approach. However, as a picture emerges regarding the desires and requirements of users for technical formats or pedagogical forms, we will be clearer as a community on how to maximise the impact of our materials and how to benefit the most from OER shared by others.

Quality control

The issue of quality assurance was again raised in this report. This has been discussed previously in relation to health-related OER (Windle *et al.*, 2010). This is a difficult issue in the OER field with many believing that quality control at the point of release requires the releaser to second guess the needs and aspirations of the reuser and imposes a level of control or censorship. However, yet again we have found quality assurance to be a driver for reuse within healthcare. It is not possible from these case studies to make inferences about other subject areas and the importance of quality control might reflect the nature of the subjects being shared within health sciences and the consequences for inaccuracy in this area. As argued previously (Windle *et al.*, 2010), a robust quality assurance mechanism supports both the release of materials by giving individuals the confidence to place their OER in a public arena, and also reuse – as highlighted here. It is often argued that it is up to the reuser to make their own informed decisions about quality control and what is relevant for them. However, within subjects such as health sciences as we have seen from the data reported in these case studies, the great potential for reuse cannot assume individual reusers have any specific knowledge or background in the area. They may be students, or particularly in this era of the expert patient (Greenhalgh, 2009) a service user or carer who may not have the skills to accurately assess materials for themselves (Hylén, 2005).

Conclusions

In summary, these three case studies show that reuse of health-related OER is occurring in a tangible way and that the early signs of the escape of resources from traditional educational institutions into the professional world and to a lesser extent wider community are starting to be seen.

Overall our recommendations would be twofold. Firstly, we recommend supporting the development of partnerships and communities around repositories of resources. While the importance of such communities around specific repositories has been long established (Douglas *et al.*, 2007), case studies such as those outlined here are beginning to show similar effects around the reuse of OER. Communities and partnerships are a fundamental philosophical position within modern healthcare, so the value of such mechanisms to the penetration of health-related OER is perhaps a natural extension of this philosophy and may come as a natural step. The case studies highlight some mechanisms that have proved successful in initiating or promoting these communities, such as the use of champions.

Secondly, it is necessary for us to take OER to where the 'real world' reuse communities are in health. We cannot expect others, especially those outside of academia, to speak our language or adopt our technical solutions. If we really want our OER to have the greatest impact then we have to be the ones to adapt our methods and processes, even if that means moving from a very purist's view of the OER world. We must work with approaches and routes of access that these communities are conversant with and that promote confidence. An example of this is the importance of quality assurance of resources at the point of release. The question is, how important is reuse to us?

References

Barr, H. and Ross, F. (2006) Mainstreaming interprofessional education in the United Kingdom; a position paper. *Journal of Interprofessional Care*. 20 (2), 96-104.

Boyle, T., Cook, J., Windle, R., Wharrad, H.J., Leeder, D. and Alton, R. (2007) An Agile Method for Developing Learning Objects. In: Markauskaite, L., Goodyear, P. and Reimann, P. (eds.) *Proceedings of the 23rd annual conference of the Australasian Society for Computers in Learning in Tertiary Education: Who's learning, whose technology?* Available from: http://www.ascilite.org.au/conferences/sydney06/proceeding/pdf_papers/p64.pdf [12 June 2012].

Campbell, L. (2003) Engaging with the learning object economy. In: Littlejohn, A. (ed.) *Reusing online resources*. London: Kogan Page.

Department of Health (2010) *Midwifery 2020: Delivering expectations*. Available from: http://midwifery2020.org.uk/documents/M2020Deliveringexpectations-FullReport2.pdf [12 June 2012].

Douglas, P., Margaryan, A. and Milligan, C (2007) *Community Dimensions of Learning Object Repositories (CDLOR) project: Use Case Overview*. Available from: http://ie-repository.jisc.ac.uk/105/1/CDLOR_use_case_overview_v1p0.pdf [12 June 2012].

Downes, S. (2006) Models for Sustainable Open Educational Resources. *Interdisciplinary Journal of Knowledge and Learning Objects*. 3, 29-44.

Greenhalgh, T. (2009) Patient and public involvement in chronic illness: beyond the expert patient. *BMJ*. 338, 629-631.

Hilton III, J., Wiley, D., Stein, J. and Johnson, A. (2010) The four 'R" of openness and ALMS analysis: Frameworks for open educational resources. *Open Learning*. 25 (1), 37-44.

Hylén, J. (2005) *Open educational resources: Opportunities and challenges*. OECD-CERI. Available from: http://www.oecd.org/edu/ceri/37351085.pdf [12 June 2012].

Johnstone, S.M. (2005) Open education resources serve the world. *Educause Quarterly*. 3, 15-18. Available from: http://net.educause.edu/ir/library/pdf/eqm0533.pdf [12 June 2012].

Larsen, K. and Vincent-Lancrin, S. (2005) *The impact of ICT on tertiary education: Advances and promises.* Washington: OECD. Available from: http://www.oems.edu.np/Blogs/Articles/upload/larsen [12 June 2012].

Lymn, J., Bath-Hextall, F. and Wharrad, H.J. (2008) Pharmacology education for nurse prescribing students – a lesson in reusable learning objects. *BMC Nursing*. 2008, 7 (2).

Rolfe, V.E. (2012) Open educational resources: staff attitudes and awareness. *Research in Learning Technology*. 2012, 20, 14395. Available from: http://www.researchinlearningtechnology.net/index.php/rlt/article/view/14395 [12 June 2012].

Rolfe, V.E. and Griffin, S.J. (2011) *Building online communities*. Paper presented at the OER11 conference, Manchester, 11-13 May.

Santos, A.I., McAndrew, P. and Menond, M. (2010) *Cultural imperialism or multicultural mix? Promoting OER reuse through collaboration.* Paper presented at the OER10 conference, Cambridge, 22-24 March. Available from: http://oro.open.ac.uk/26995/1/ [12 June 2012].

SONET (2010) *RLO usage map*. Available from: http://www.nottingham.ac.uk/nursing/sonet/rlos/rlo_worldmap.html [12 June 2012].

UCAS (2012) *HE subject dataset: Applicants preferred subject choice and accepted applicants subject of acceptance*. Available from: http://www.ucas.com/about_us/stat_services/stats_online/data_tables/hesubject [12 June 2012].

Wenger, E., McDermott, R.A. and Snyder, W. (2002) *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Boston, MA: Harvard Business School Press.

Wiley, D. (2007) *On the sustainability of Open educational Resource Initiatives in Higher education*. Paris: OECD/CERI. Available from: http://www.oecd.org/edu/ceri/38645447.pdf [12 June 2012].

Williams, P. (2011) *Content Leverage System*. Available from: http://download.marketsamurai.com/AS_AT110823TS01AS_Leveraged_Content_Creation.pdf [12 June 2012].

Wharrad, H.J., Kent, C., Allcock, N. and Wood, B. (2001) A comparison of CAL with a conventional method of delivery of cell biology to undergraduate nursing students using an experimental design. *Nurse Education Today*. 21 (7), 579-588.

Windle, R.J., Wharrad, H., McCormick, D., Laverty, H. and Taylor, M. (2010) Sharing and reuse in OER; experiences gained from open reusable learning objects in health. *Journal of Interactive Media in Education* 2010: JIME Special Issue on Open Educational Resources.

Windle, R.J., McCormick, D., Dandrea, J. and Wharrad, H. (2010) The characteristics of reusable learning objects that enhance learning: a case-study in health-science education. *British Journal of Educational Technology*. 42 (5), 811-823. Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8535.2010.01108.x/abstract [12 June 2012].

Windle R.J., Wharrad, H. and Laverty, H. (2011) *Community reuse, impact and resource creation in health sciences*. Paper presented at ALT-C conference, Leeds, 6-8 September.

World Health Organisation (2009) *Global Health Risks Mortality and burden of disease attributable to selected major risks*. Available from: http://www.who.int/en [12 June 2012].

Yergler, N.R. (2010) Search and discovery: OER's open loop. In: *Proceedings: Barcelona Open Ed 2010*. Available from: http://openaccess.uoc.edu/webapps/o2/bitstream/10609/4852/6/Yergler.pdf [12 June 2012].

Open Educational Resources websites and repositories referred to in this report

HALSOER, Health and Life Science Open Educational Resources: http://www.biologycourses.co.uk

HELM, Health E-learning and Media: http://www.nottingham.ac.uk/helm

SCOOTER, Sickle Cell Open – Online Topics and Educational Resources: http://www.sicklecellanaemia.org

TIGER, Transforming Interprofessional Groups through Educational Resources: http://tiger.library.dmu.ac.uk/

VAL, Virtual Analytic Laboratory: http://tinyurl.com/oerval