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## **Transformation for an open education repository: Issues associated with IT and Computing distance learning course materials**

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Topic areas: Distance learning in higher education and Teaching of Information Technologies and Informatics.

### **Abstract**

The number of Open Educational Resource Repositories available worldwide continues to grow and many contain course materials from campus-based institutions. The Open University in the United Kingdom (UK) has influenced the OER movement by releasing traditional distance learning course materials as OERs. This paper discusses issues associated with the transformation of Open University distance learning course materials in the IT and Computing subject area into OERs.

### **Introduction**

Open Educational Resources (OERs) primarily from campus-based institutions have been available since 2002. MIT was the leader in this field with the OpenCourseWare (OCW) initiative (Smith, and Casserly, 2006). This initial venture was followed by other institutions, which include: John Hopkins Bloomberg School of Public Health, Rice University Connexions, Utah State University, Wikiversity, Sharing of Free Intellectual Assets (Sofia), Open Learning Initiative from Carnegie Mellon, China Open Resources for Education Initiative and Japanese OCW Alliance. More recently The Open University in the United Kingdom (UK) entered the OER arena by presenting distance learning course materials as OERs. The transformation of distance learning IT and Computing course materials into OERs, is the focal point of this paper.

Vest (2004) reported from both survey responses and anecdotal evidence that academics from other institutions used OCW materials provided by MIT. Without doubt the reuse of materials is a key element to the success and sustainability of OERs. The OER movement has encouraged the sharing of assets between individuals and organisations (Atkins et al., 2007). However Vest's (2004) comment suggests that the MIT OERs need to be supported by a lecturer. This is not surprising as the delivery of teaching in campus-based institutions is often heavily reliant on the lecturer(s) and what they themselves convey through their design and personal delivery of course material. Indeed the impact of the actual course material may be limited without the presence of the lecturer. The core of the delivery is dependent on what the lecturer adds to their notes; slides; activities and assessment in order to bring it alive. This raises the question of how the lecturer can be replicated in a virtual sense when their teaching materials are used as OERs? Until we can address this question the author suggests that conceivably more distance-learning materials (which already embody the lecturer(s) in the form of Supported Open Learning) should be transformed into OERs. Over the next five to ten years distance learning OERs could have the potential to become an interim panacea to the worldwide shortage of educators in higher education. Certainly life-long learning needs to be actively supported through easy access to online educational resources (Geser, 2007).

This paper focuses particularly on distance learning higher education OERs, which have been developed by the UK Open University, a recent entrant into the OER

domain. The UK Open University has joined this field of enquiry with a new enterprise called OpenLearn (Open Content Initiative, 2006). This initiative is funded by the William and Flora Hewlett Foundation and was launched on 25<sup>th</sup> October 2006. In the past year over one million visitors have accessed the OpenLearn environment. Although this paper focuses on IT and Computing OERs, more information is available about OpenLearn (Wilson, 2007; McAndrew and Hirst, 2007) and the OERS available in other subject areas ([www.open.ac.uk/openlearn](http://www.open.ac.uk/openlearn)).

### **Distance learning materials delivered as Open Educational Resources**

The Open University in the UK has been developing high quality distance learning materials since 1969. A team of academics called a 'course team' creates traditional Open University distance learning courses. The materials are iteratively developed and critically reviewed. The subsequent course uses a variety of multiple media resources. The combinations and permutations of text and other media can vary greatly across the vast catalogue of courses. Multiple media components in Open University distance learning courses include but are not limited to those in table 1.

**Table 1 Different resources can be combined in Open University distance courses**

CD_ROM / DVD	Audio/ video
Assessment	Software
Set book/co published book	Poems
Blocks of course material	Standards documents
Course guide	Internet resources
Course website	Index
Virtual Learning Environment (VLE) / email and conferences	Glossary

Given this diverse range of possible resources, it is difficult at first to identify course materials that will transfer easily into OERs and moreover work well in the online medium. Academics in the OpenLearn team work with subject specialists to identify distance learning material that can be transformed into OERs. The OpenLearn academic team then undertake an exploration of how the materials should be transformed into OERs (see Connolly, Ferreira and Wilson, 2007).

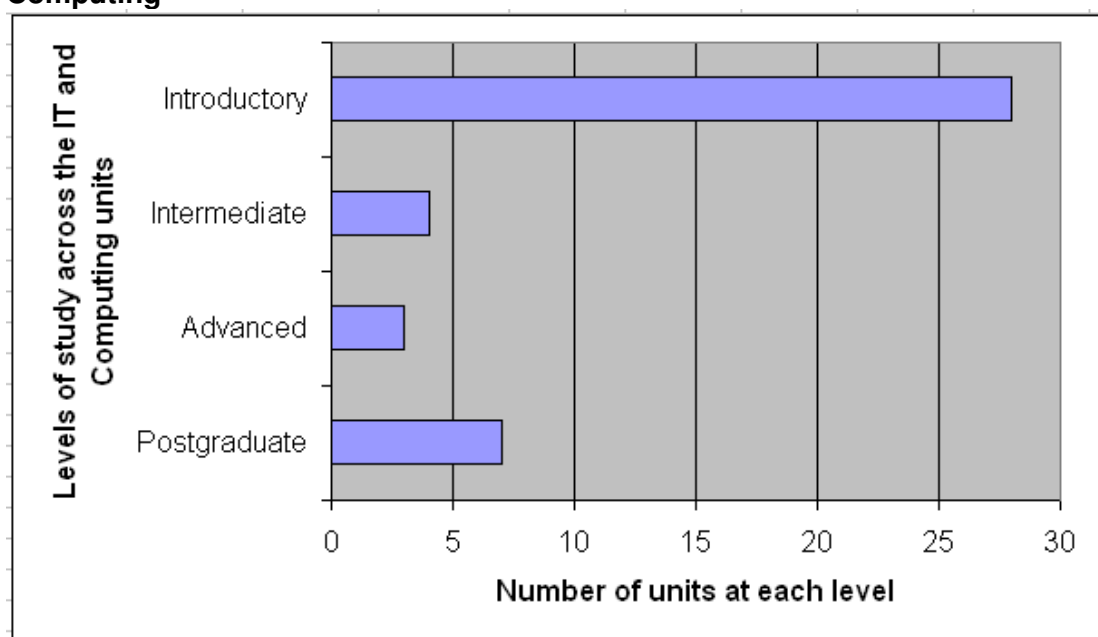
OER units of varying lengths of study time are available across eleven different topic areas in OpenLearn and the numbers of units available continues to increase. By April 2008 13,500 study hours (5400 plus 8100) will be available across OpenLearn's twin websites. The OER units across these eleven topic areas vary in length between four hours and thirty hours and are categorised within a particular level of study (Lane, 2006). The materials are taken from the original Open University supported open learning courses, which include tutorial support and assessment. Within OpenLearn these materials, called 'units', are standalone without organised tutorial support or formal assessment. Let us now focus on the IT and Computing topic area.

### **IT and Computing materials delivered as OERs**

The IT and Computing topic area of OpenLearn presently holds forty-two OER units. In total they account for four hundred and forty-four hours of study time and these units vary in length between three and thirty hours. OER units in the IT and Computing topic area are available across the four different levels of study (Lane, 2006). Twenty-eight units are available at introductory level, four at intermediate

level, three at advanced level and seven at postgraduate level, see figure 1 (level descriptors are used as explanations for worldwide use).

**Figure 1 Levels of study across the distance learning OER units in IT and Computing**



Although the units span the four levels of study the vast majority of those available at present are at the introductory level. This is consistent with the notion that new users to distance learning course material would prefer to start with preliminary units.

The next section explores in summary how one of the forty-two OER units was transformed from the original material. Consideration is given to a number of the issues involved when transforming distance learning course material in the IT and Computing discipline into an OER.

### **Converting distance learning course material in IT and Computing into an OER**

The majority of OER units presently available on the OpenLearn Website have been transformed under what Lane (2006) describes as the 'Integrity model'. Essentially the OER units keep faith with the original material and as little change as possible is made to the original content. This discussion is not ignoring relevant related issues such as Intellectual Property, Copyright and contracts of employment although they are not discussed further here.

Course material that transformed particularly well into an OER (in the author's opinion) was offered from the course 'Fundamentals of interaction design'. This is an advanced level course in IT and Computing and contains: a course guide, four blocks of material, an index, glossary, assessments, and a DVD. These were all originally developed or brought together by The Open University academic 'course team'. In addition the course uses a 'set' book, which was developed separately (see Figure 1). The 'set' book and the blocks of material include many self-assessment and review questions with feedback whilst the DVD includes video clips and computing activities (again with feedback).

Thirty-nine pages from Block 2 of the course and the associated resources on the DVD (see figure 1) were selected for processing as an OER. The chosen section did not rely on the 'set' book.

**Figure 1 Showing resources in the 'Fundamentals of interaction design' course**



The media types in the original section of course material include:

- text which is interspersed with figures, tables, text boxes and bulleted lists.
- reflective activities with feedback and
- computer activities with feedback (on the DVD).

The excerpt from Block 2 was entitled 'Accessibility: an introduction' and the OER was subsequently called 'Accessibility in interaction design'. The resulting OER accounts for 15 study hours. The author suggests that this OER has a good balance between the amount of text to read on screen and the number of activities in terms of Web delivery. Under the 'Integrity model' this OER reflects the original design of the course material from the originating academic. The material (chosen from the 'Fundamentals of interaction design' course) appears to have been developed by the originating academic in a way that also suits web delivery. This would not necessarily be the case for all distance learning course materials.

A rough guide to the balance between the amount of text as compared to the number of reflective and computing activities in the original chosen section of material follows. Generally no more than half to one and a half pages of A4 appears as text (which is interspersed with figures, tables, text boxes and bulleted lists) before an activity (reflective or computing) is presented. The original material contains twenty-one activities (thirteen reflective with feedback and eight computing also with feedback). The eight computing activities are described in table 2.

**Table 2 Descriptions of the eight computing activities**

Cognitive disabilities simulation	Avatar demonstration
Visual simulation	Video clips showing assistive devices
Screen reader simulation	Video clip of a dyslexic computer user
Software to support accessibility	Testing a web page for accessibility

The reliance on a small number of resources (part of a block of course material and some of the DVD content) made this a relatively straight forward yet interesting section of material to transform into an OER. The material selected did not rely on the use of the 'set' book, which may not have transferred well for Web delivery under the 'Integrity' model. In addition there could have been issues (as indicated above), which include copyright in the case of the 'set' book. Although the computing activities in this OER make use of software applications on various websites there were no issues related to licensing or ownership of (proprietary, third party or in-house) software. The latter could affect the suitability of quite a number of IT and Computing materials for transformation into OERs. The video clips originally delivered on DVD were also suitable for web delivery. Otherwise the video clips if longer than ten minutes in length would have needed edits at appropriate points to make them into smaller clips. This would not be a trivial task if the original video sequences were thirty minutes or more in length. The video clips did not contain background music, which could have been expensive to clear in terms of copyright. Also those appearing in the video clips gave their permission for use of this material on OpenLearn. This type of agreement from participants can often take time. The resulting OER 'Accessibility in interaction design' can be viewed at [www.open.ac.uk/openlearn](http://www.open.ac.uk/openlearn)

The main aim with OERs is to provide high quality learning materials, which are freely available worldwide. However making the original course material into an OER has produced a number of enhancements by:

- bringing the different resources together as a cohesive whole
  - for example the ability to carry out the computing activities online through various websites rather than on the DVD.
- making web links (appearing in the text of block 2) live to allow access to the associated web resources.

This coarsely grained analysis suggests the need for a careful choice of course material and an assessment of all the resources (see Table 1 above) necessary to form the eventual OER.

### **Factors in the identification of material that will transfer easily into an online OER**

The discussion in this paper is based on the author's experience of transforming distance learning course material into OERs (and previous work with IT and Computing course material in closed environments (Wilson & Whitelock, 1997a; Wilson & Whitelock, 1997b)). The author suggests that some types of distance learning material transfer more easily and are more reusable than others. The 'Accessibility in interaction design' material appeared to transfer relatively easily as an online OER under the 'Integrity model' for a number of reasons.

A number of factors, which appear to affect the transferability of distance learning course materials into OERs are as follows:

- The balance between the amounts of text as compared to the number of activities in the original material.
- The number of reflective activities as compared to the number of online or computing activities.
- How the text is interspersed with figures, tables, text boxes and bullet lists.
- Where reflective/computing activities with feedback are placed in the text
- The size (number of pages and number of study hours) of the original course material.
- The number of different resources (see table 1) in the original material.

- How the course is developed in the first instance.
- Suitability of video/audio sequences for web delivery.
- Permission for usage of video/audio sequences from participants.
- Clearance costs for background and incidental music.

In an ideal world the original course material needs to be assessed in terms of its suitability for OER web delivery. The following criteria are suggestions, which need further investigation and subsequent refinement. In judging the suitability of course material for an OER, assess whether the:

- Selected material is overly laden with text.
- Density of text, figures and activities is ideal for web delivery.
  - perhaps have no more than half to one and a half pages of A4 appearing as text before an activity is presented.
- Selected material has been written with Web delivery in mind.
- OER contains (proprietary, third party or in house) software.
- Material has any reliance on a set book or co-published book.
- The types of resource are easily transferable for web delivery (eg length of audio and video clips).
- Number of study hours is appropriate for web delivery (is the unit too long?)
- Usage of the video/audio sequences will be expensive in terms of copyright
- Contents of video or audio sequences require permission for usage.

The discussion in the main has been concerning the IT and Computing subject area. However the suggested criteria for assessment may well be applicable to other disciplines.

## **Conclusions**

This paper has alluded to the need for provision of more distance learning OERs, which embody the lecturer in the form of supported open learning. The discussion has covered a number of issues involved in the transformation of IT and Computing distance learning materials into OERs. Criteria have been suggested to assess the suitability of course materials for transformation into OERs. However these suggested criteria are only a first stab at trying to establish what is involved in transformation. As such they need to be tested on different course materials from different disciplines, further refined and extended.

A more general issue is the heavy reliance on text by certain disciplines as compared to others. In the case where the amount of text appears excessive for web delivery under the 'Integrity' model it would appear that redesign is required before the material can be delivered as an OER on the Web. This suggests that subject content which relies less on text (perhaps IT and Computing, Maths, Science and Study Skills) may be more suitable for transformation into OERs under the 'Integrity' model than materials from other disciplines. These issues require further study and subsequent analysis.

OERs have great potential in furthering the cause of education for all. Yet it is still early days in terms of realising how, when, where and why distance learning OERs will be adopted, adapted and utilised worldwide.

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