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Citation

Lane, Andrew and Law, Andrew (2011). Sharing and reusing rich media: lessons from The Open University. In: OCWC Global Conference,, 04-06 May 2011, Boston, Massachusetts.

URL

https://oro.open.ac.uk/29199/

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Sharing and reusing rich media: lessons from The Open University

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Abstract
OpenCourseWare and Open Educational Resources comprise many types of assets including rich media. However dynamic rich media offer different opportunities and challenges for learners, teachers and higher education institutions alike than do more static items such as text. The Open University in the UK has been extensively developing and using rich media in its distance teaching programmes since it was established in 1969, often in partnership with the BBC. As new media technologies have arrived so has the capabilities of The Open University to create rich media. This paper describes these developments and then discusses the approaches required to guide them in a way that both serves the university and the wider higher education community. It concludes that rich media are an essential part of the developing OCW/OER landscape and that openly sharing them brings defined benefits to an HEI beyond their traditional student body.

Keywords
OpenCourseWare, Open Educational Resources, rich media, sharing

Introduction
OpenCourseWare (OCW) comprise many types of assets including dynamic rich media (audio or video tracks, animations, podcasts) and many individual open educational resources (OER) now consist solely of rich media with channels such as iTunesU and YouTube EDU partly dedicated to them. However dynamic rich media offer different opportunities and challenges for learners, teachers and higher education institutions alike than do more static items such as text, slides and graphics. They offer technical and pedagogical challenges to teachers and learning challenges to students. They are relatively easy to use as is but more difficult to re-purpose. They can be more costly in money and effort to produce than more static media and in principle would benefit from being shared with others or collaboratively developed to save on such costs. So what value do rich media provide to higher education institutions and how should they use them as OER?

The Open University in the UK (OUUK) has been extensively developing and using rich media in its distance teaching programmes since it was established in 1969. It has particularly benefitted from a longstanding partnership with the public service British Broadcasting Corporation (BBC) who have helped both in the development of certain rich media but also provided free to air broadcasting slots for radio and television programs, originally aimed only at students (but with a wider drop-in viewing audience) and latterly with a more explicit public engagement remit. As new media technologies have arrived so that relationship has developed, as has the capabilities of the OUUK itself to create rich media in other ways and with other partners. In 1999 the OUUK and the BBC collaborated on a UK focussed website (Open2.net) that supported the broadcast programs. In 2006 the university entered the formal OER world with the launch of OpenLearn. In 2008 it began its iTunesU and YouTube channels. In 2010 it has brought all this activity under the OpenLearn brand.

While the initial start up costs for OpenLearn were mostly covered by an external grant from the William and Flora Hewlett Foundation most of this 40 or so years of activity has been funded through the University's internal resources gained from teaching grant and student fee income. The OUUK has therefore always looked strategically at what this involvement with public facing

rich media does to further the mission of the University. This paper first outlines the major characteristics of the University, gives a brief history of its public broadcasting and use of new technologies, particularly ICTs, then describes these strategic considerations and finally discusses the approaches and evidence required to guide and shape strategy in a way that both serves the University and the wider higher education community. It concludes that rich media are an essential part of the developing OER landscape and that openly sharing them brings defined benefits to an HEI beyond their traditional student body.

The Open University's key institutional competencies and achievements
The Open University in the UK is open to people, places, methods and ideas. It promotes educational opportunity and social justice by providing high quality education to all those who wish to realize their ambitions and fulfil their potential. Through academic research, pedagogic innovation and collaborative partnership it seeks to be a world leader in the design, content and delivery of supported open and distance learning (see http://www.open.ac.uk/about/ou/p2.shtml for more details about the OUUK)

As the UK's only University dedicated to using open and distance learning for its taught programs, and the first 'open university' to be created in the world, the OUUK has pioneered methods for large-scale delivery of educational opportunities through what it calls 'supported open learning', whereby it adds a wide range of support services (for example information, advice and guidance, tuition, assessment, credit rating, credit transfer, specialized hardware and software for disabled students) around the specially developed educational materials that students need to study:

1. It delivers at scale by servicing a quarter of a million students and users of its course materials each year;
2. It has taught two million people and awarded more than 350,000 degrees since 1971; and
3. It has a prodigious international reach with students and partners in over 100 countries.

The Open University curriculum is rich in the range and types of academic content which can be harvested for open educational resource delivery:

1. Courses and programs range from the access to higher education level to taught doctorates, including research-based doctoral degrees;
2. Courses and programs have been developed across a wide spectrum of academic areas from the arts and humanities to mathematics, science and technology, including major interdisciplinary programs; and
3. The curriculum is increasingly being developed to cater for those with professional and vocational learning needs.

The University has a wide range of curriculum products available in a variety of media from which to select for open publishing:

1. Standard printed texts can be made available in PDF, Word and/or XML formats;
2. CD-ROM and DVD based audio-visual materials and educational software are available, along with course materials which have been developed specifically for on-line usage;
3. Television archive footage, photographs and images are another source of potential content (although some is not currently in a digital format); and
4. Standard course materials comprising text, audiovisual and software elements that have already been developed or 'versioned' for web delivery.

The University has experience of developing and supporting formal and non-formal learning opportunities designed to:

1. Facilitate support processes which encourage the creation of learning communities and stimulate an appetite for further study such as extensive use of electronic conferencing;
2. Encourage access to formal higher education; and
3. Work with partner organizations to reach target groups which do not traditionally have access to university study or lack confidence to begin study.

Through its course team processes, the University has a long history of bringing together subject specialists with experts in learning technologies. This enables:

1. Matters of subject content to be considered alongside learning technology issues;
2. A major focus on the quality of learning and the technologies deployed to support it; and
3. Creative critical interaction across different skills sets.

The University employs tutors for set groups or batches of students working on an individual course. Recognizing that different students have different learning styles and approaches, the tutors help the students in their groups to navigate and approach the materials in ways that suit each student's individual needs. The tutor therefore facilitates the learning process as much as directly re-interpreting parts of the teaching embodied in the educational materials.

The excellence of the OUUK's learning materials and their delivery is recognized nationally and internationally. This is evident in, for example:

- The award to the University of Middle States Commission on Higher Education (MSCHE) Accreditation in the USA;
- The past assessment of the UK Quality Assurance Agency, which placed 17 of the 23 subjects reviewed at the University in the 'Excellent' category;
- The outstanding feedback from students received in the UK National Students Survey in the last 4 years (http://www.hefce.ac.uk/learning/nss/) with the University being ranked in the top 3 every time;
- The awarding of the 2006/07 Prize of Excellence from the International Council for Open and Distance Education; and
- The OpenLearn initiative (www.open.ac.uk/openlearn) winning a platinum award – the top honor - at the IMS Global Learning Consortium Learning Impact Awards 2007 as judged on learner achievement, impact on faculty adoption, financial return, impact on access, impact on accountability, and use of interoperability standards.

We have provided this brief overview of the OUUK's competencies and achievements so that our discussion of its use of rich media for over 40 years can be seen in the context of how it organises its teaching.

A history of broadcasting at The Open University
In 1969, the year the OUUK received its Royal Charter, establishing it as an accredited and independent University. It was initially named in the early planning stages as a 'University of the Air' by the UK Government (Weinbrein, 2011a) and so a feature of its implementation was a relationship from the outset with the BBC through which both have benefitted and both been able to experiment with new technologies. Indeed, a BBC production department for OUUK

programs was set up at Alexandra Palace, London, in premises vacated by TV news. The first OUUK broadcasts of programs that supported the other specially prepared educational materials devised for the courses and mailed out to students, went out on the BBC TWO channel – itself a recent innovation – and on Radios 3 and 4, in the first week of January 1971. They actually preceded the signing of the first of a series of formal agreements which has governed the relationship between the University and the BBC ever since. This took place in December 1971.

For many in the UK these early black-and-white TV programmes still conjures up images of earnest, bearded professors with flipcharts as many were devised as 'studio lectures'. But they made the OUUK a household name, and at the time, they were breaking new ground in educational programming. Social scientist Professor Michael Drake, one of the academics who took part in those pioneering recordings, recalled the challenges in a later interview. *"Each programme took one day. We rehearsed once, then recorded it, with no stopping because of errors. I'm surprised I don't have nightmares still."* And there was innovation. OU lecturer Robert Bell recalled many maths programmes which *'involved ingenious working models that would have been unavailable then in a conventional university'*.

A number of technological developments were used or trialled at the OUUK Production Centre; the BBC's first video rostrum camera, for example, was installed at Alexandra Palace, London in the 1970s. People think of Open University TV programmes being broadcast to an audience of bleary-eyed students and insomniacs late at night, because in the days before video recorders, they had to be shown in slots outside the main programming schedules of the BBC channels and when students were available to view the transmission itself – before BBC2 started up on weekday evenings, and on Saturday and Sunday mornings.

The OUUK Production Centre was moved to the Walton Hall campus in Milton Keynes in July 1980, where technological innovation in production continued. In 1983, the Production Centre's outside broadcast truck was replaced with two portable single camera units, pioneering lightweight VT (videotape) recording for non-news programmes. In 1986, the OUUK Production Centre provided video facilities to the national Domesday Project, which encouraged schoolchildren across the UK to send in text and images for central storage and which incidentally later raised the issue of the permanence of digital materials (Darlington et al, 2003).

Meanwhile viewing habits were changing significantly. No longer did students have to watch material only at the time it was broadcast, thanks to the widespread take-up of video recorders during the 1980s and into the 1990s. This allowed for OUUK programmes to be broadcast during the then overnight BBC TWO Learning Zone and recorded by students for watching later. And in the 1990s the University's work also expanded beyond course related programmes. It began to commission peak-time series for BBC channels while continuing to deliver material specifically related to individual courses in the late-night Learning Zone.

By 2002, technological advances had again changed the nature of the University's broadcast activity. Audio-visual material for courses was made directly by the University and sent to students in the form of CDs and DVDs. The Production Centre at Milton Keynes closed in September 2003. December 2006 saw the last of the course-related programmes to be shown on the Learning Zone. But OUUK broadcasting on mainstream TV and radio continues – the following year, 2007, saw more than 20 TV series go out bearing The Open University logo. Since then the OUUK's mainstream broadcasting has gone from strength to strength. *Coast, Child of our Time, Chinese School, Fossil Detectives, James May's Big Ideas, History of Scotland, Olympic Dreams*…are all Open University programmes and ones which have often

been taken up by other broadcasters around the world. They attract larger and more diverse audiences than the old course related programmes could hope to, with viewer numbers for the most popular into the millions. Production qualities are high, with a number of series, such as *Coast*, winning awards. And the programmes still retain solid academic content. No less than three OUUK programmes: *Tree of Life, Darwin's Dangerous Idea* and *Jimmy Doherty in Darwin's Garden* – were shown to mark the 200th Darwin Anniversary.

OUUK academics still have a significant input to the content of the broadcasts, although TV professionals and personalities are more likely to be the presenters nowadays. The OU also makes an input into existing flagship BBC programmes such as *Timewatch, The Money Programme* and a number of David Attenborough's natural history epics. And on radio, OUUK programming has also gone increasingly broader with series such as Radio 4's statistics detective show *More or Less*, new technology BBC World Service series *Digital Planet* and Radio 5's *Breaking Science*.

A history of information and communication technologies use at The Open University
The OUUK was founded on what Harold Wilson, the Labour Prime Minister credited with proposing and then establishing the University (Weinbrein, 2011b), called "*the white heat of technology*" - and it has played a vital role in the University's development ever since. In the beginning there was the belief that technology could bring high quality degree-level learning to people who had not had the opportunity to attend campus universities. And when students did not have access to technology – it would be sent to them. Among these were Home Experiment Kits which were sent out to thousands of students studying the Science Foundation course in the early 1970s. These included the McArthur microscope which was adapted from an original metal design, to make a cheaper, lighter moulded plastic model. Students studying biology as part of their second level studies in science were lucky enough to receive pickled sheep brains, weighing about 4oz, which would be dissected with instruments supplied in the kit. Replica fossils were also sent to geology students, which meant realistic casts were made in a garage which got over the obstacle of students not being able to get hold of real fossils, so they could examine the next best thing. Computers were even sent out to students. These included the 64KB HEKTOR III, a single board computer built by the OUUK for *The digital computer* course, which came with a 104-page manual.

In the early 1980s computer courses used mainframe systems and students had to go to regional centres to type in their answers and get print-outs. In the 1990s, more and more courses, mainly maths, computing, technology and science started to use the power of the Personal Computer and multi-media formats. For example the *Discovering science* course in 1998, used video footage of flora and fauna on the Galapagos Islands. This footage was re-worked last year for iTunesU and after promotion from Apple, it quickly became one of the most popular downloads on the site. Another course, *Environmental Science* delivered a virtual field trip in its first two or three weeks which meant students could carry out measurements, observations and analysis of the growth of heather in the Teign Valley in the county of Devon without having to leave their homes – or get wet. This was particularly useful for disabled students, or other students who would be unable to go on an actual field trip.

Of course the emergence of the Internet, modems and web browsers enabled the University to provide much more of the educational materials online rather than having to send them through the post and enable much more two way communication between OUUK staff and students than was possible through post and telephone. The first major course to be delivered mainly online was *You, Your Computer and the Net* in 2000, when nearly 12,000 students signed up for it in this first year! Since 2006 all OUUK courses utilise ICTs to some degree such that some or

most of the educational content is available from a course website (although also available in physical form) but most communication is now done through the internet.

Equally, since 2006, the OpenLearn website makes OUUK materials freely available on the internet with state-of-the-art learning support and communications tools to connect learners and educators around the world. However the University had previously taken advantage of the new opportunities offered by the advent of the internet and new media, developing an online learning portal, Open2.net, with the BBC in 1998 that supported and supplemented the broadcast programs. Broadcasting has changed out of all recognition over the last 40 years, and TV and radio have been joined by other new media. Open University material is now available through a variety of channels, not only OpenLearn but also through YouTube and on Apple's iTunesU service. But broadcasting and its partnership with the BBC remains a central part of what The Open University does – making learning accessible. Part of the OUUK's mission is to reach out beyond its students, stimulating people to learn, and opening up access to new learning opportunities across a range of areas of interest and concern.

Sharing and using rich media educational content from The Open University
Ever since it started teaching students in 1971 some of the educational content produced by the OUUK has been openly available and accessible to people within the UK (less so outside the UK). Many of its teaching texts are co-published with educational publishers and so available (at cost) in bookshops or (at less cost or for free) from students who have completed the course and no longer want them or (for free) in public Libraries. More importantly, all the television and radio broadcasts, whether course related or of a wider nature, have been done through free-to-air public channels run by the BBC so that the UK public could both watch them for free and (later on) freely record them off air for personal viewing at a more convenient time. BBC surveys consistently showed there was a substantial drop-in viewing audience for even course related programs broadcast early in the morning, many of whom had no intention of studying the related courses but liked the programs because they were educationally focussed. The more recent non-course related programming has gained even more substantial viewing audiences and because of the relationship with the BBC has been available for time limited viewing outside the broadcast slot (usually only in the UK) via its iPlayer software platform.

While individuals could record these programs for their personal use it was illegal to show them to a 'public audience'. This could even be the case where it was done for students at another University (it is the scale of such use that made it possible or not through the educational exceptions elements of the relevant copyright legislation) but all UK Universities were able to sign up for a general licence that enabled them to record and use as many OUK/BBC programs as they wished (no such licence was ever devised for the physical educational content but they were available (at cost) to be recommended texts in other Universities courses while many of the tutors were teachers at other Universities and were very creative in re-using the course materials provided with the course they were supporting in their own courses). This open availability and accessibility of rich media (in this case radio and TV programs) meant that 'use as is' has been happening quite a lot in the UK, which has been a good thing for all concerned, particularly as these resources have been produced to high academic quality (often involving top academics from other universities as consultants) and high technical standards (drawing on BBC experience) both of which can make it a costly exercise. However all this content was still only available under a full rights reserved license so any user could not make alterations or repurpose these educational resources without first seeking permission (indeed internationally our OU Worldwide division has made revenue from the selling and licensing of some of this content).

Since joining the OCW/OER movement in 2006 (Gourley and Lane, 2008) the OUUK has been increasingly making some of its rich media content open available and accessible through OpenLearn and proprietary channels. While doing so only a proportion has been under a Creative Commons licence. This is because a lot of the legacy material contains 3rd party material (particularly music and BBC content) that would cost to be cleared for open release (if able to be cleared at all) with those rights owners or involves additional payments to actors and other contributors to the original programs. Even so, where we have been able to publish such rich media content on YouTube this has given teachers the freedom to use the embed capabilities of YouTube videos to enable greater 'use as is' but in the broader context of a course, unlike tracks from iTunesU which are for personal use by a learner. And while we often provide both low and high resolution versions of AV assets that are CC licensed there is inevitably reluctance on the part of other users to modify material that already has been highly structured for an educational purpose. However, as implied above, the OUUK itself is looking to reuse as much of its own content as reasonable and make it available in different formats through different channels that suit the needs of different users. The University is also taking on board the scope for more quicker and flexible ways to produce rich media content and so we encourage academics and others to produce and publish their own podcasts created at their own desks, and provide training in what makes a good podcast and for them to be more than just a 'studio lecture'.

The advantages and disadvantages of rich media for learning
Whether it is for formal study by students or informal study by a wider s community of learners, rich, time based media can play a unique role in the teaching and learning experience:

- Substitution: In a distance education context, it is sometime necessary to use rich media to substitute for what might have happened in more traditional contexts. For example rich media have often been used as substitutes for the 'real thing' such as a recorded 'studio' lecture or a 'virtual' science experiment. This is particularly important for students studying at a distance, or with limited mobility - where access to these may be limited and or where the costs of provision at home (for example a 'home experiment kit') is prohibitive;

- Supplementing: While some basic uses of rich media compensate for the necessary constraints of distance education, other features provide unique and powerful complements to more tradition text based or face to face provision:

    o Unique Access: Students can be given access to worlds which are difficult to access even in traditional teaching contexts (arctic ice formations, deep sea life),

    o Impossible Access: Students can be shown simulations or animations of events or activities that are out of reach of human experience (inside the core of a working nuclear reactor, the unfolding process of the big bang, or the complexities of sub atomic interactions).

    o Archive: Much of the history of the 20th century is now captured on film in documentary and news archives. These archives provide students with unique access to new ways of understanding politics and history.

    o The Human element: Rich media have enabled learners to listen to or watch interviews to help not just understand what key people have to say, but how they say it. It might be possible to provide a summary account or transcript of a poetry

reading or an interview with a victim of a crime. However, a first person recording can have both a powerful impact and provide potentially important or essential information missing within a transcript (intonation, emotion, pace etc).

- o The Emotive element: Rich media combinations of carefully composed picture sequences, words and music can ensure not just that information is conveyed but that it is enhanced with emotional or visceral impact as well.

- o Dual Processing/Parallelism: The provision of audio tracks, alongside a pictures or diagram is potentially a very powerful pedagogic combination. It allows the learner to pay attention to a diagram, a table or image while spoken descriptions, commentary, analysis or instructions are provided in the audio track. This can be much more effective than the provision of a textual instruction alongside the image- as the learner often struggle to 'flip' back and forth between the object of interest and the instructions.

- o Time based media and processes: Revealing or explaining the structure and process of a complex system that changes over time can be significantly enhanced through time based media, for example animations of the working human heart or the workings of a combustion engines. Time lapse can also provide unique understanding of processes that could never be perceived or properly understood in real time.

- Finally, the Medium is the message: Film, radio and TV materials are often themselves the subject of study, or the object of skills practice (e.g. content analysis).

So rich media can provide a wide variety of unique and powerful teaching and learning experiences, supporting a range of teaching activities and learning styles. They have an obvious popular appeal and ICTs and the internet have shown that people now expect to consume not just text but video, audio and animations. However, they can also prove to be expensive distracters. Years of experience and research has shown that rich media is effective when its unique features are actively exploited. There are real dangers to using rich media simply as texture or 'decoration' for the text (the 'illustrative' talking head, revealing nothing additional of the speaker that a transcript would not).

In addition, as with any form of good teaching and learning experience, passive interaction with such rich media is always much less effective than more active engagement. Learners usually need to be directed to undertake tasks that require closer examination of the rich media than treating it as though it were a broadcast program. And such engagement is ensured if study of the rich media is necessary for the completion of course assignments! In other words the rich media are there to help learners achieve a specific learning outcome and not just for interest.

Another important feature of rich media out in the open on the internet is that their technical appeal matches their popular appeal. It is often the case that search engines favour video and audio tracks which in part is because of the popularity of websites that feature such content (e.g. YouTube is one of the top ten visited websites and its resident search facility one of the most used means of searching). So releasing educational content as rich media rather than as text can be a way to make your content much more discoverable. It is noticeable that a number of Universities have concentrated on AV tracks for their OCW/OER.

Equally, the greater availability and usability of new media technologies means that the wider public can generate and publish their own rich media, often openly licensed, shifting them and their relationship to one of being producers as well as consumers (so called pro-sumers – see http://en.wikipedia.org/wiki/Prosumer).

Strategic use of rich media
The Open University in the UK has had rich media as a major part of its teaching and outreach activities since it began, consistently spending several million pounds sterling on them.

To begin with the programs were devised as course related materials that either substituted for the actual observation of laboratory experiments, field sites (e.g. factories, art galleries, nature reserves, museums) plays or other performances; provided interviews with key academics or professionals talking about particular topics; demonstrations of principles through animations or models; or acted as studio rather than classroom based lectures. While these programs were supplemental to the other course materials and varied in their centrality to the learning outcomes of the courses, their broadcasting, as already noted, had an important part to play in the University's Royal Charter obligation to *'provide for the educational well being of the wider community'*. In the early days this was a serendipitous rather than planned benefit although it began to further shape the nature of the programmes that were produced as it was realised that there were multiple audiences for them and not just students, and as noted above these audiences were formally surveyed for their interests or offered unsolicited comments upon them.

Through the extensive surveys of students and other learners the purpose of these openly available rich media has been guided by a model of engagement whereby the relationship someone has with the OUUK could go through four phases:

1. Awareness – of the University and its association with certain rich media;
2. Interest – in using some of the media as a 'consumer';
3. Engagement - by contacting the OUUK for further information or informal educational materials supporting the programs (such as posters and leaflets);
4. Commitment – to a formal offering from the OU, most usually signing up for a course but could be another event or service

This learner journey can be very varied and occur over many years but recognises that, as lifelong learners, people are wanting a broader relationship with what the OUUK has to offer than just being a student (although they can also be students for many years as well since most study part time and take several years to complete a qualification). The emergence of the internet has provided many more possibilities for having more meaningful two way communications with this wider community alongside those we have with students. Indeed widening access to and participation in higher education study is a central part of the OUUK's mission which OER have greatly helped with (Lane, 2008a).

The OUUK's current strategic approach to OER in general and rich media in particular is one of aligning it with the major activities and functions of the University as guided by its mission. Thus rich media are used to provide the most appropriate and effective learning experience for registered students seeking qualifications; to enable a wider public set of audiences to have informal learning opportunities; to use both to showcase the University's teaching and outreach programmes and increasingly its research findings; and to be part of a multi-way communication network with a wide number of stakeholders.

Conclusions

At one time only very dedicated amateurs with money could produce good rich media to compare with that produced by media professionals. The advent of ever cheaper and widely available digital technologies has made the process of producing rich media accessible and affordable to many more people. The rises of sites like YouTube are a testament to this trend. While much of this new content may be usable for educational purposes it is content devised specifically for an educational purpose (OER) that will be of most use for teachers and learners alike (Lane, 2008b).The bringing together of educational experts (such as at the OUUK) with media specialists (such as at the BBC) can provide the most effective OER. However, as OER, most of this use of this rich media will be 'as-is' without modification and repurposing since although the technical scope for remixing has never been easier, the pedagogical use of rich media is still a very new and little understood part of educational practice.

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