



# **Preservation of e-Learning Materials: an attitudinal study**

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## **Disclaimer**

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## 1. Introduction

It is recognised that whilst a great deal of work has been carried out over the past few years to develop e-learning materials across the UK HE/FE sector relatively little work has been done to define what role preservation/curation has to play in the stewardship of this digital material and how valuable it is to think of e-learning materials as items that need these measures applied to them. Within this context, JISC commissioned Evidence Base at Birmingham City University to undertake an investigation of attitudes to the curation and preservation of e-learning objects.

The key objectives of the project were:

- To identify and solicit opinion from a range of individuals, groups and organisations with views relevant to the issues in question
- To identify and extract relevant information from existing resources that are pertinent to this study.

The study was conducted between May and October 2008.

## 2. Approach

The focus for this study was firmly on eliciting the attitudes to the curation and particularly the preservation of e-learning materials through drawing on evidence provided through existing resources and feedback from the community. More information on the approach is provided below:

### ***Review of existing resources***

A brief review of the existing body of literature focussing on the attitudes to the preservation of e-learning materials was undertaken. A number of relevant projects were also identified. The findings are presented in Section 4.

### ***Feedback from the community***

A key aspect of the project involved obtaining feedback from individuals, groups and organisations within the JISC community. Feedback was obtained in a variety of ways including face to face interviews, telephone interviews and email surveys. Interviews were the preferred method of data collection as it allowed scope to explore a complex area in depth.

Interviewees included those from organisations with a potential interest in the area of preservation of e-learning objects, those involved in projects in this area and those within institutions who had a relevant role, such as heads of learning and teaching units, learning technologists, repository and VLE managers. Interviewees were identified through a variety of means. This included direct requests for feedback, for example where an organisation was known to be working in, or have an active interest in the curation and preservation of e-learning objects and requests for interviewees either through recommendation or requests posted to a variety of mailing lists and through other sources. The mailing lists that were posted to were:

- JISC-repositories
- VLE
- Records management

- HELF (Heads of e-learning)
- JORUM update
- UCISA-TLIG
- IIS-SCONUL
- TLT-officers (Teaching and learning technology officers in universities)

A request for information was also circulated to the Higher Education Academy (HEA) e-portfolio list, but there were no replies. On the advice of the HEA, individual emails were then also sent to the contacts at each Subject Centre. The Digital Preservation Coalition (DPC) also circulated a note to its members on issues raised by this study, but received no replies.

A broad set of topics was devised with additional topics tailored to suit appropriate individuals and organisations. The topics covered included: drivers for preservation and issues arising; reuse and sharing of e-learning materials; legal and regulatory framework; current storage of e-learning materials; the impact of Web 2.0 resources. In addition all those interviewed were asked if they were users or contributors to Jorum and for their views on Jorum in relation to the preservation of e-learning materials. Information about attitudes to preservation was also gathered from those who had taken part in the Jorum external user evaluation in 2007<sup>1</sup> and their reported comments on preservation.

In total 42 people gave feedback to this study. Two were from the further education community and the others from higher education.

There was a low level of response to requests which may in itself indicate a general lack of interest in the preservation of e-learning materials. The recent JISC report on the retention of learning materials<sup>2</sup> similarly found a poor response to its online survey of HE and FE institutions and suggested this was due to a low level of interest or awareness.

Although this study did not approach academic staff directly, views were gained from staff across a range of different roles, in particular from those in e-learning who had a good overview of attitudes among both management and teaching staff, as one interviewee explained:

*Heads of learning and teaching sit in an in between space between the wider management group and faculties and centres, between strategy and operations.*

In spite of the low level of response, those who did reply generally gave full answers which could be followed up in more detail in interviews. There was also a level of consensus among those in the study which made it possible to draw some general conclusions. However, caution is needed in interpreting the findings of this report because of the small number of respondents.

It should be noted also that this study does not attempt to report the attitudes of academic staff directly, but rather the attitudes expressed by those who are responsible for e-learning.

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<sup>1</sup> [http://www.jorum.ac.uk/docs/pdf/070717\\_JorumExternalUserEvalFinalJC.pdf](http://www.jorum.ac.uk/docs/pdf/070717_JorumExternalUserEvalFinalJC.pdf)

<sup>2</sup> Emmerson, P(2008) Retention of learning materials: a survey of institutional policies and practice. <http://ie-repository.jisc.ac.uk/149/>

### 3. Key definitions

The key definitions used in this report predominately follow those given in the first Jorum Preservation Watch report.<sup>3</sup>

#### Digital preservation

*The series of managed activities necessary to ensure continued access to digital materials for as long as necessary*<sup>4</sup>

#### Long-term digital preservation

The first Jorum Preservation Watch report suggests that after five years hardware and software used to create the learning objects will be obsolete:

*Digital preservation involves the application of technologies and methods to ensure that information remains accessible and meaningful in the long term. The International Council on Archives state that the hardware and software that create a record will typically last five years at current rates of technological change. If this is the case, it is likely that maintaining access for even ten years will require preservation processes to be undertaken.*

A report for the Digital Preservation Coalition suggests that 'long-term' could refer to a period exceeding 20 years<sup>5</sup>

*Digital preservation differs from 'traditional preservation' in that digital information needs to be actively and continuously managed – it cannot be simply stored and left on a shelf. In addition, the timeframe during which action needs to be taken is short. Problems can arise in as little as five years and certainly more than twenty years would be highly likely to cause difficulties if information has not been properly managed during that time. When we talk about 'long-term' we are therefore referring to anything needing to be kept for more than twenty years, a relatively brief period for print materials.*

There are a number of factors that affect preservation, relating to the content itself, the technology and the associated contextual information. This study takes a broad interpretation of long-term preservation to allow users to identify time frames that were important to them.

#### Digital curation

*Active management over the whole life-cycle of the materials, from creation to destruction (or indefinite preservation) and about adding value to data.*

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<sup>3</sup> Jorum preservation watch report (2005)  
[http://www.jorum.ac.uk/docs/pdf/Digital\\_Preservation\\_Report.pdf](http://www.jorum.ac.uk/docs/pdf/Digital_Preservation_Report.pdf)

<sup>4</sup> Jones, M. and Beagrie, N. *Preservation Management of Digital Materials: A Handbook*, 2003, Available at:  
<http://www.dpconline.org/graphics/handbook/>

<sup>9</sup> Heslop, H (National Archives of Australia). *An Approach to the Preservation of Digital Records*.  
[http://www.naa.gov.au/Images/An-approach-Green-Paper\\_tcm2-888.pdf](http://www.naa.gov.au/Images/An-approach-Green-Paper_tcm2-888.pdf)

<sup>5</sup> Waller, M & Sharpe, R. (2006). Mind the gap: assessing digital preservation needs in the UK. Digital Preservation Coalition. <http://www.dpconline.org/docs/reports/uknamindthegap.pdf>

## Learning object

*Any resource that can be used to facilitate learning and teaching that has been described using metadata.*

## Archive repository or digital archive repository

*A repository that provides reliable long-term access to resources, thus requiring some preservation process to be undertaken, as opposed to a repository that provides access to resources in the short term, without altering them in any way.*

## E- Learning materials

E-learning materials are defined in the ITT<sup>6</sup> as:

*Collections of simple digital objects (digitised photographs, text, graphics, maps, etc.) that are packaged together in some sort of container, the purpose of which is to define the relationships between the individual component items and to contextualise them in relation to the pedagogical aims of the material.*

This definition is used in the study, the emphasis being on materials developed for learning and teaching and not on administrative documents such as course syllabi, assessment procedures etc.

## 4. Key points from existing resources

Much of the literature on digital preservation deals with technical issues often based on an assumption that digital objects are always worth preserving. Preservation may also be studied in relation to research material held within institutional or other repositories, rather than e-learning materials which may be held in a variety of different locations. There have been few studies that look at attitudes to preservation of e-learning materials from the users' viewpoint and question whether e-learning materials should even be preserved at all.

However, several reports, mainly arising from JISC work in this area, do raise topics that are relevant to a study of attitudes. Foremost among these are the two Preservation Watch reports from Jorum. Alongside the Jorum repository itself, a Research and Development strand has produced a number of documents, including two Preservation Watch reports, the first in November 2005<sup>7</sup> and the second in July 2006.<sup>8</sup> The first Preservation Watch report provides an overview of current activities, standards and recommendations relating to digital preservation, and provides a starting point for further work on a long term preservation strategy for learning objects held within the Jorum repository. The second Preservation Watch report builds on the work of the first, summarising some current initiatives and focussing on some key issues to be addressed in connection with a preservation process for Jorum. After a survey of a number of initiatives both in the UK and overseas, including some

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<sup>6</sup> <http://www.jisc.ac.uk/media/documents/funding/2008/01/elearningmaterials.doc>

<sup>7</sup> Jorum preservation watch report (2005)  
[http://www.jorum.ac.uk/docs/pdf/Digital\\_Preservation\\_Report.pdf](http://www.jorum.ac.uk/docs/pdf/Digital_Preservation_Report.pdf)

<sup>8</sup> Jorum preservation watch report (2006)  
[http://www.jorum.ac.uk/docs/pdf/Jorum\\_Preservation\\_Watch\\_Report.pdf](http://www.jorum.ac.uk/docs/pdf/Jorum_Preservation_Watch_Report.pdf)

examples of learning object repositories, it goes on to look at 'the case for and against preservation', identifying some reasons why selected learning objects should be actively preserved, rather than leaving preservation just to chance.

While the primary focus of these two Preservation Watch reports is on the possible role of Jorum in the preservation of e-learning objects, they contain a good deal of material on preservation issues more broadly which is very relevant to a study of attitudes. These are therefore described in some detail in this section to provide useful background against which the comments from surveys and interviews can be considered.

This study attempts to look at the demand for preservation from the user community, bearing in mind that the drivers for preservation, as set out in this first Preservation Watch report, are the potential for e-learning materials to be shared, reused and repurposed, and the possibility of more materials being deposited if long term preservation is offered.

Rather than producing a literature review which would duplicate much work already done by others, a number of key points are identified here from the two Preservation Watch reports and other relevant reports and projects. These key points then form the basis for the report on the survey of the user community.

## **4.1 Is there a case for the long-term preservation of e-learning materials?**

A starting point for a study such as this should be to query whether in fact e-learning materials should be preserved at all or whether they should be regarded as ephemeral items to be discarded once the particular course for which they were produced is finished. There is recognition in the first Jorum Preservation Watch report of the need to ask this question:

*The first question to ask is whether it is worth preserving learning materials at all. It is important to put forward compelling arguments for long term preservation*

The report also regards the attitudes of users as important in making decisions on preservation:

*The requirements of the user community are key to the decisions about what to preserve and how long to preserve it for*

The main emphasis in the literature is that a case can be made for preservation and that users need to be convinced of its importance. This study first looks at the arguments for preservation put forward in the literature and then considers these arguments from the user viewpoint.

## **4.2 Can comparisons be made with other types of material?**

Some writers anticipate that the success of some institutional repositories in building up research content may lead to a similar pattern emerging for e-learning materials. This view is given in the first Preservation Watch report:

*The proliferation of institutional repositories seems to validate the principle of sharing many types of digital materials, and it is hoped that this will be echoed in repositories that deal more specifically with learning materials.*

The WM Share project<sup>9</sup> took a different view:

*The issues in teaching content sharing may be very different from those in the research papers open archives area, and the two should not be conflated, either from an institutional services point of view or from a cultural/human perspective.*

In looking at institutional repositories (see section 4.5), it is apparent that few have included learning objects. The OpenDOAR Directory of Open Access Repositories<sup>10</sup> lists 97 repositories in the UK that contain journal articles, but only 13 that contain learning objects. It is questionable whether it is appropriate for the two different types of material to be treated in the same way, though views may differ on this. The demands of the Research Assessment Exercise (RAE) and its successor the Research Excellence Framework (REF) have undoubtedly contributed to the growth of institutional repositories as a showcase for an institution's research output, aided by the Research Councils' encouragement to deposit the outcomes of funded research. There has as yet been no similar pressure for the deposit of e-learning materials.

### **4.3 What reasons are given for preservation?**

When considering attitudes to preservation, it is important to consider the reasons put forward, so that community views can be sought against each of these. This section identifies the main reasons given in the literature for the preservation of e-learning materials.

#### **Reuse and sharing**

One of the main reasons given for preservation is the opportunity it provides for reuse and sharing. In the first Jorum Preservation Watch report, learning objects are seen as intellectual capital:

*In terms of long term preservation, reuse is a key concept, as preservation enables use over time, and this implies repurposing materials for different contexts.*

*It could be argued that if the community sees learning objects as worth sharing, then they are worth preserving.*

Preservation is seen as a means of continuing access, with reuse a way of increasing the value of materials and avoiding having to re-create anew:

*It is important to stress that preservation is not the aim in itself but rather the means to the end, which is to provide continuing access. This should increase the value of the materials created, and it may offer the benefit of avoiding the constant recreation of materials that have been deleted.*

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<sup>9</sup> <http://www2.worc.ac.uk/wm-share/>

<sup>10</sup> <http://www.opendoar.org/> accessed 22.10.08

It is recognised that the user community will need convincing of the benefits of this approach:

*It will be important to convince the community that reusing and repurposing materials over the long term rather than constantly recreating them is a worthwhile activity*

The assumption is made here that reuse and sharing are beneficial, and that the user community needs convincing of this. In presenting possible arguments against preservation, the second Preservation Watch report acknowledges that this reuse may not happen:

*Apart from any other arguments that may be put forward against preservation, it may be that reuse over time does not happen in reality, but as we are still in the early stages of an online learning culture, we do not yet have the evidence for this.*

The second Preservation Watch report also discusses the findings of various research studies on the reuse of learning objects, and refers to the JISC report on long-term retention and reuse of learning objects and materials published in 2004<sup>11</sup>, which examined the challenges affecting retention and reuse:

*The management of teaching and learning materials for long term use has been identified as an area in which there is room for improvement. Good quality resources have not always been utilised to their full potential and there is often duplication of work.*

Charlesworth, in a report for JISC on sharing eLearning content<sup>12</sup> studied over 30 JISC-funded projects and found evidence of little formal sharing, but 'a lot of informal, small-scale sharing with colleagues and collaborators'. Most of those involved in these projects felt that sharing would not take place unless cultural, legal and organisational issues were addressed, and that:

*Putting technical solutions in place without institutional commitment or knowledge of user requirements is likely to be unproductive.*

The WM-Share project, which investigated use of shared e-resources in the West Midlands<sup>13</sup> similarly found that lecturers were using informal methods of sharing with colleagues rather than formal methods.

In an article on the DART (Digital Anthropology Resources for Teaching) project, part of the JISC funded Digital Libraries in the Classroom initiative, Bond draws attention to a general lack of reuse in the academic community, citing particularly evidence from the MERLOT repository:

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<sup>11</sup> Barker, E et al (2004) Long-term retention and reuse of e-learning objects and materials. Report commissioned by the JISC.

[http://www.jisc.ac.uk/whatwedo/programmes/programme\\_preservation/project\\_elo.aspx](http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/project_elo.aspx)

<sup>12</sup> Charlesworth, A

[http://www.jisc.ac.uk/whatwedo/programmes/programme\\_preservation/project\\_elo.aspx](http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/project_elo.aspx)

<sup>12</sup> Charlesworth, A et al (2007) Sharing eLearning content: a synthesis and commentary. <http://ie-repository.jisc.ac.uk/46/>

<sup>13</sup> WM-Share team (2006). West Midlands Share: promoting shared use of digital teaching content across the West Midlands region. Final report. <http://www.jisc.ac.uk/media/documents/programmes/distributedelearning/wmsharefinalreportjuly06.doc>

*It is clear that developers are enthusiastically creating reusable learning objects (RLOs) in ever-increasing numbers, and are sharing them by placing them into learning object repositories (LORs). The MERLOT repository, based at California State University (CSU), boasts 16,325 RLOs at the time of writing (MERLOT website, 2007). However, there is little evidence yet that these RLOs are being picked up and used by teachers outside the original development teams.*<sup>14</sup>

It is clear, therefore, that reuse and sharing are seen as important drivers for preservation, though there appears as yet little evidence that this is actually taking place.

### **To encourage deposit**

As has been recognised, there is a need to encourage deposit in all types of repository and offering a 'safe haven' where materials will be preserved may encourage more content, as the first Preservation Watch suggests:

*Many repositories sell themselves on the basis of secure storage and similarly, within an e-learning repository, long-term access may help with motivation to deposit.*

The first recommendation of the first Preservation Watch report refers to the potential demand for long term preservation and also to the possibility that preservation will itself encourage deposit:

*To set out a case for preserving learning materials as far as is possible within the constraints of available information and to present the case for preservation to the user community, to try to gauge whether there is a potential demand for learning materials over time and whether long term preservation will encourage deposit.*

Recognition for the creators of e-learning objects is also seen as a possible encouragement to deposit:

*The motivation for producing learning objects may be increased if creating them improves the profile of a teacher within their subject area, and maybe beyond. This is certainly taken as read for research outputs, and is one of the drivers for deposit into eprints archives.*

The findings of the Rights and Rewards project<sup>15</sup> suggest that a guarantee of preservation is an important consideration when depositing e-learning materials in any sort of repository.

As noted above (section 4.2), it may not be valid to compare e-learning materials with research output, though it is certainly the case that there appears now to be little incentive to deposit e-learning materials in repositories and little recognition

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<sup>14</sup> Bond, S.T. et al (2008). Reuse, repurposing and learning design: lessons from the DART project. Computers & education 50, 601-612

<sup>15</sup> [http://rightsandrewards.lboro.ac.uk/files/resourcesmodule/@random43cbae8b0d0ad/1150709518\\_Final\\_Report\\_of\\_Survey.pdf](http://rightsandrewards.lboro.ac.uk/files/resourcesmodule/@random43cbae8b0d0ad/1150709518_Final_Report_of_Survey.pdf)

to be gained from doing so. This is an important point to consider when looking at community attitudes to preservation.

## Legal, administrative and policy reasons

One obvious reason for preserving e-learning materials is where there are legal or administrative reasons for doing so. In relation, for example, to student appeals, queries may arise where evidence from e-learning materials may be of value. Subject reviews may benefit from access to earlier course materials. The JISC HEI records retention schedule<sup>16</sup> refers to records that document procedures and policies and recommends various retention periods for different classes of record. While it does not refer specifically to e-learning materials, a common sense approach might be to retain these at least until the end of the course for which they were produced, and for a year or two following. This would guard against possible appeals by students and keep the retention of actual materials on the same basis as records and procedures to which they relate. Harvey suggests a longer period 'for the lifetime of the course (up to a decade), with a selection maintained permanently.'<sup>17</sup> A JISC briefing paper in 2008<sup>18</sup> recommends institutional strategies for the management of learning and teaching materials, including policies on copyright and ownership. Emmerson's study on the retention of learning materials<sup>19</sup> looked at institutional policies and practices and found few examples of institutions that had policies or formal guidelines that covered learning materials.

Also relevant to this area is a forthcoming report by Neil Beagrie for JISC on universities' learning and teaching strategies and implications for digital preservation.

## Continued use of the original learning object

The second Preservation Watch report defines one group of users for whom preservation is important as those for whom 'the original learning object remains valid', in that they are continuing to use the original form for teaching purposes. It recognises that more work is needed to identify patterns of use among these users. There is an argument that in some subject areas changes are less dynamic and so the original learning object remains valid over a longer term:

*In subject areas where changes over time are less frequent, there is a stronger case for the preservation of the learning object.*

A possible argument presented against preservation in the second Preservation Watch report is that newer learning objects may be easier for users to access and more suited to current pedagogy. Even if the object itself remains valid, continuing to use older versions of the software may make it appear old-fashioned in terms of functionality and design. Continued use may therefore not be a valid reason for preservation even where the content of the object itself is not out-dated.

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<sup>16</sup> <http://www.jiscinfonet.ac.uk/partnerships/records-retention-he>

<sup>17</sup> Harvey, R. (2002). Now You See It, Now You Don't: Maintaining Digital Learning Objects for the Future. [http://www.usq.edu.au/electpub/e-jist/docs/Vol5\\_No2/Harvey%20-%20Final.pdf](http://www.usq.edu.au/electpub/e-jist/docs/Vol5_No2/Harvey%20-%20Final.pdf)

<sup>18</sup> JISC briefing paper: managing & sharing e-learning resources: how repositories can help. (April 2008) by Andrew Rothery (<http://www.jisc.ac.uk/media/documents/publications/bpelearningreposv1.pdf>)

<sup>19</sup> Emmerson, P(2008) Retention of learning materials: a survey of institutional policies and practice. <http://ie-repository.jisc.ac.uk/149/>

## The materials have historical importance

As well as users continuing to use e-learning materials where the content remains valid, the second Preservation Watch report identifies a further group who may use learning objects for historical purposes. Historical importance is one of the reasons given for preservation:

*The arguments for keeping learning objects for their historical importance are the same arguments that might be used for any historical documents. It is important to value our heritage, be it cultural, social or intellectual.*

In this sense historical importance may relate either to the value of the actual material, for example a learning object constructed by a famous or yet to be famous academic, or a piece of ground-breaking work, or to the pedagogical aspects, as a record of the type of learning and teaching materials used at a particular point in time.

While recognising that given the cheapness of digital storage, it may be easier to keep everything than to select, the report does not consider this a viable option in view of the sheer quantity of material and increased preservation costs as formats are superseded. Rather the report recommends the keeping of a selection of objects for 'study by future generations'.

The JISC guidelines produced in 2007<sup>20</sup> accompanying the records retention schedule appear to suggest that a selection of material should be kept for 'Long term research needs or wider societal expectations'. This is a recognition of the possible historical importance of some e-learning material. These guidelines emphasise also the need to make 'positive decisions on retention' and to avoid keeping records 'just in case' and see a role for academics:

*....who can advise on long-term research value of records and their significance from a wider cultural perspective*

## Costs of creation

There is an argument that says if resources in terms of time and money have been spent on the creation of e-learning materials then this is itself reason for preserving them, reuse or repurposing being possibly more economical than creating anew. This point is made in the second Preservation Report:

*It is important to secure the maximum benefits from the investment made in the creation of materials. It makes no sense to recreate materials that have already been created; it makes much more sense to modify existing materials for new purposes.*

This was certainly one of the reasons put forward for the establishment of Jorum (see section 4.5), with the requirement to deposit appropriate materials from any JISC-funded project.

At the same time, the second Preservation Watch report draws attention to the need to monitor technological advances, which will have a bearing on any cost/benefit

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<sup>20</sup> <http://www.jiscinfonet.ac.uk/partnerships/records-retention-he/hei-rrs-user-guide>

analysis in respect of the preservation of e-learning materials. It may in fact be cheaper, easier and more practical to create new learning objects than to invest in infrastructure needed for preservation.

As with most of the reasons put forward for preservation, there are two sides to be considered here. Firstly, there is an argument for preserving materials which have been costly to produce, but then there is also a consideration as to whether the cost of preserving outweighs the cost of creating objects anew. This is considered further in the section of migrating technology (section 4.4)

## 4.4 Deciding what to preserve

If a case can be made for the preservation of some e-learning materials, then a selection process is needed to decide what should be preserved. The second Preservation Watch report acknowledges that there are currently no quality assurance procedures for learning objects. It may not be the responsibility of the repository to make such judgements, but if it is agreed that an archive cannot hold everything, then a selection process is needed.

The second Preservation Watch report also makes the point that as roles and responsibilities are not clearly defined, decisions on how to select and who should be responsible are more complex:

*Responsibilities within digital preservation are currently not well defined. There is a need to clarify the roles that surround learning object repositories, which include information providers and information creators, owners, users, funders and repository service providers*

The Digital Preservation Coalition's Mind the Gap report<sup>21</sup> gives a similar view of digital preservation in general:

*Most organisations are hindered by a lack of clear responsibilities for digital preservation, a problem complicated by the need to involve a range of staff with different skills and the need to involve users at all stages of the information lifecycle.*

The Digital Preservation Coalition's decision tree<sup>22</sup> offers a possible approach to selection, based on a series of questions which begin with making decisions on long-term value and then going on to consider rights and responsibilities as well as technical and metadata implications and associated costs. Although not specifically addressing e-learning materials it does provide a framework for four distinct areas that affect decisions on long term preservation which are relevant to community attitudes:

- Value of the materials themselves
- Technical issues
- Metadata
- Rights and responsibilities associated with them

These four areas are considered in more detail in this section.

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<sup>21</sup> Waller, M & Sharpe, R. (2006). Mind the gap: assessing digital preservation needs in the UK. Digital Preservation Coalition. <http://www.dpconline.org/docs/reports/uknamindthegap.pdf>

<sup>22</sup> Digital Preservation Coalition (2006) Interactive assessment: selection of digital materials for long term retention. <http://www.dpconline.org/docs/handbook/DecTree.pdf>

## Determining value

If decisions on preservation are to be based on the long-term value of the learning objects, then it needs to be decided who should be responsible and how selection should be undertaken.

- **Uniqueness**

One factor to consider is whether the learning object is unique, or whether other versions exist. A problem with e-learning materials as with other digital assets is establishing how many different versions are in existence. This is especially the case if the original learning object has been reused or repurposed. E-learning materials may be held in a variety of locations, and in a variety of forms and versions. According to the second Preservation Watch report, establishing whether a learning object is 'unique' and therefore worthy of preservation is not straightforward:

*The value of most assets will increase if they are seen as unique, and this is a concept that requires further consideration as far as learning objects are concerned.*

- **User responsibility**

One possibility is to leave decisions entirely to individual users once they have downloaded materials. This possibility is rejected by the second Preservation Watch report as inconsistent:

*Preservation could be treated as a passive activity; something that is effectively user-led. Users download the objects from Jorum and integrate them into their own environments which may effectively mean migrating resources from an older version of the software to a newer version.*

This approach can lead to problems with version control, and long-term preservation can clearly not be left to individuals in this way if reuse and sharing are important factors to consider. Users, however, are still seen as having a major role in identifying what should be preserved. Usage levels are important, though as both Preservation Watch reports point out, it is difficult to predict the level of use over time and to correlate usage with quality.

- **Assessing quality**

Users can also contribute to the process by giving comments on the quality of material they have used, with star ratings or other means. Such an approach is likely to be more common with Web 2.0 developments, and as users become more accustomed to seeking and adding to product reviews on other websites.

The Jorum Preservation Watch reports recommend that the comments and star ratings used in Jorum could form part of the quality appraisal process. This would be similar to the approach taken by Merlot<sup>23</sup>, where peer review of learning materials is an important element. As is seen in section 4.3, however, such quality assessments in Merlot do not in themselves appear to have led to increased use or reuse outside the group that originally created the objects.

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<sup>23</sup> <http://www.merlot.org/merlot/index.htm>

- **Cost as measure of value**

Although cost in itself is not an indicator of value, it must surely be the case that e-learning materials developed over a period with project funding are more worthy of long-term preservation than a series of PowerPoint slides developed specifically for a particular course. Repositories such as Jorum have taken as their starting point the need to establish a home for JISC-funded projects to ensure at least their medium term preservation, though as section 4.5 shows, no decisions have yet been made about long term preservation in Jorum.

## **Ease of migrating technology**

The ease with which learning objects can be preserved as technology changes is also a consideration, with questions of format or structure needing to be taken into account. Barker's 2004 study for JISC on the long-term retention of e-learning materials<sup>24</sup> includes the following recommendation:

*The development of e-learning materials to appropriate standards and specifications will greatly ease preservation issues associated with long-term retention, and will simplify reuse.*

There is a suggestion here that decisions on preservation should be made at the start of the process rather than at the end of it when the technology used is already obsolete or obsolescent. The Digital Preservation Coalition's Mind the Gap report<sup>25</sup> makes a similar recommendation:

*Because of obsolescence and the impermanence of digital media, digital preservation should start as early in the lifecycle of a digital resource as possible, preferably when actually planning to create digital information. Decisions made at that time, regarding formats and essential documentation, will have major implications for the ability to retain those materials for even the short term, let alone medium to long-term.*

A survey by the PREMIS (Preservation Metadata Implementation Strategies) working group in 2004<sup>26</sup> looked particularly at how cultural heritage institutions were implementing preservation metadata. An important aspect of this was the way that plans were made for preserving objects on a long term basis when the technology became obsolete. In this area where long term preservation is vital, they found most institutions were using a variety of preservation strategies.

The ReSET project in 2005-6<sup>27</sup> took TLTP (Teaching and Learning Technology Programme) and other legacy resources in engineering and data communication and used them to produce reusable learning objects to be deposited in the VLEs of partner institutions and in Jorum for general use. Experiences such as this project

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<sup>24</sup> Barker, E and others (2004) Long-term retention and re-use of e-learning objects and materials. [http://www.jisc.ac.uk/uploaded\\_documents/LTR\\_study\\_v1-4.doc](http://www.jisc.ac.uk/uploaded_documents/LTR_study_v1-4.doc)

<sup>25</sup> Waller, M & Sharpe, R. (2006). Mind the gap: assessing digital preservation needs in the UK. Digital Preservation Coalition. <http://www.dpconline.org/docs/reports/uknamindthegap.pdf>

<sup>26</sup> PREMIS working group (2004) Implementing preservation repositories for digital materials: current practice and emerging trends in the cultural heritage community, <http://www.oclc.org/research/projects/pmwg/surveyreport.pdf>

<sup>27</sup> <http://esdstudent.gcal.ac.uk/reset/index.htm>

and work on recovering the BBC Domesday project videodiscs<sup>28</sup> demonstrate how challenging preservation can be. There is a cost/benefit analysis to be done in relation to any preservation process that involves technological changes.

## Preserving the context

In deciding on the preservation of a learning object, decisions also need to be made on what contextual information to preserve. This point is made in the second Preservation Watch report:

*It may be argued that an archive of learning design should preserve not just the learning object and metadata, but all of the documentation surrounding the learning objects.*

Preserving a learning object without its associated metadata and contextual information may make it less valuable in historical terms, where the way it was used may be of as much interest as the object itself.

There is also the question of which version should be preserved, given that reuse and repurposing will in themselves create different versions. These versions may be stored in different locations, or there may be 'virtual objects' where metadata is held in one location but the materials are stored elsewhere.

## Rights issues and IPR

Preservation has implications for digital rights. The TrustDR project<sup>29</sup> considered practical issues in setting up digital rights management systems in learning object repositories. The ReFORM project, funded under the JISC e-learning capital programme<sup>30</sup>, aims to redevelop an existing course using predominantly external content in order to develop an improved understanding of the reuse of learning objects. In using external content, a major part of its work has been in connection with establishing rights and this has led to a greater understanding of the role of IPR in reuse.

## 4.5 Location for long term preservation

If users are to have continuing long term access to at least a selection of e-learning materials currently available, then it needs to be determined where best such materials should be kept. This is not seen as an immediate problem in an environment where the focus has been on building up content but could be a problem in the longer term where archived materials may need to be differentiated from those in current use.

The report commissioned by JISC on the significant properties of e-learning objects (SPeLOs) by Ashley et al<sup>31</sup> examines the nature of learning objects in order to identify the significant properties of these objects which it is essential to retain for preservation. The report estimates that three years is the likely life span of an object

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<sup>28</sup> Darlington, J and others (2003) Domesday Redux: the rescue of the BBC Domesday Project videodiscs. Ariadne, 36. <http://www.ariadne.ac.uk/issue36/tna/>

<sup>29</sup> <http://trustdr.ulster.ac.uk/>

<sup>30</sup> <http://www.edgehill.ac.uk/reformproject/>

<sup>31</sup> Ashley, K and others (2008) Significant properties of e-learning objects (SPeLOs). [http://www.jisc.ac.uk/media/documents/programmes/preservation/spelos\\_report.pdf](http://www.jisc.ac.uk/media/documents/programmes/preservation/spelos_report.pdf)

in terms of technology obsolescence, so that any longer term preservation needs special attention:

*LOs are not preserved merely by being stored or managed in a Virtual Learning Environment (VLE) or any other online storage and retrieval system (such as JORUM or COLEG). There is a strong argument that, like any other digital object, LOs can only be deemed to be being preserved when held in a digital archive which accepts and discharges the key responsibilities identified in the OAIS model - whether implicitly or explicitly. This may mean that there will be a migration stage to take the objects out of the operational system and into a preservation repository. It is, however, equally possible that an operational VLE or other system can also perform a preservation function.*

This section looks at some possible locations for the long term storage of e-learning materials, from national or subject based repositories to possible locations within individual institutions.

## **Jorum**

The Jorum service was set up in 2005 to provide a repository for learning and teaching materials in UK higher and further education. It is run by the EDINA and Mimas national data centres. It is a requirement of JISC funding that suitable project materials are deposited in Jorum and other contributions are encouraged, whether developed with public funding or within HE and FE institutions. The aim is to create a repository where e-learning materials can be collected, reused and shared across the HE and FE communities. As at 29 October 2008, there were 414 HE/FE institutions signed up as users and 97 as contributors.

Jorum moved into its second phase in August 2008, and will be introducing three new licensing regimes, JorumOpen, Jorum EducationUK and JorumPlus, which take account of such significant drivers as Web 2.0 and the open access agenda.

In relation to preservation, there are two issues to consider as to Jorum's role:

1. Should Jorum be responsible for archiving its own content and if so, how?
2. Should Jorum have a wider archival responsibility?

### **Archiving the Jorum content**

In respect of the first question, it would seem that Jorum, in common with most other repositories of any type, institutional, subject or learning object, has been more concerned with building up content than with considering long term preservation.

Jorum policy documents include the Jorum collection development policy published in May 2007.<sup>32</sup> In discussing the removal of materials, it acknowledges that with the focus on building up content there was at the time of writing no removal policy. Removal would also require version control from a technical viewpoint.

*While Jorum reserves the right to withdraw materials if advised by experts that they are out of date or inaccurate, a removals policy would also imply consultation with users and experts on how materials are being used.*

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<sup>32</sup> Jorum collection development policy [http://www.jorum.ac.uk/docs/pdf/Jorum\\_Collections\\_Policy.pdf](http://www.jorum.ac.uk/docs/pdf/Jorum_Collections_Policy.pdf)

The current Jorum licence is perpetual and not time-limited. If items were to be withdrawn after a certain time, this would need technical rights management functionality to identify items for withdrawal. At present the Jorum licence covers long term preservation and right to re-format, but for legal reasons learning materials cannot then be redeposited within new learning objects.

The wide variety of object types, the virtual objects over which it has little control, and lack of clarity over retention periods mean that Jorum cannot make an open-ended commitment to keep all objects. There is currently no way of knowing whether learning objects deposited in Jorum are in fact unique or whether they are also deposited elsewhere.

Its 'preservation promise' commits to ensuring that it will maintain object packaging in a way that can be interpreted by current widely-available tools.

### **Wider archival role for Jorum?**

It should be noted that Jorum currently has no separate archive and has not yet addressed issues of appraisal and possible deletion of learning objects held within it. It does not give any time limits for the retention of deposits. The first Preservation Watch report suggests that if an archive were developed, it could either be part of Jorum or a separate service.

It is suggested in the second Preservation Watch report that if Jorum is to be seen as a 'trusted digital repository', then it could increase content and take on more responsibility for preservation:

*If Jorum is to be a trusted repository, then this must surely be a strong argument for taking on the responsibility for preservation, and fulfilling the other attributes of a trusted repository.*

If such a policy were to be pursued and a separate archive were set up either within Jorum or separately, this would imply a policy of selection and raise questions of exactly what should be preserved. The current policy of building up content and making conditions which facilitate preservation was not considered sustainable without selection.

Other questions relevant to community attitudes would be responsibility for preservation costs within Jorum if ownership of the object remains with the institution, as well as issues of rights and IPR etc which would be of concern to the producer of the e-learning materials.

### **Subject repositories**

A number of the subject centres run by the Higher Education Academy (HEA) have their own subject repositories which contain learning objects. For example, the Economics network contains 600 sources of online teaching materials<sup>33</sup>, and the Information and Computing Subject Centre has a repository of reusable learning objects developed through its project funding<sup>34</sup>.

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<sup>33</sup> <http://www.economicsnetwork.ac.uk/links/othertl.htm>

<sup>34</sup> [http://www.ics.heacademy.ac.uk/resources/rlos/rlo\\_repository.php](http://www.ics.heacademy.ac.uk/resources/rlos/rlo_repository.php)

The CD-LOR project found that subject was an important variable in sharing and reuse:

*Research has shown that subject area is among the major variables that can impact the potential for sharing and reuse. Some disciplines may be more successful than others in reuse. Patterns of technology use may vary across different disciplines*<sup>35</sup>

Each subject repository is likely to have its own preservation policy, and as the CD-LOR project shows, reuse and sharing will vary by subject.

For the FE community, NLN Materials<sup>36</sup> funded by the Learning and Skills Council (LSC) provides 'one of the most substantial and wide-ranging collections of e-learning materials in the UK'. Materials can be downloaded for use in VLEs or elsewhere.

## **Institutional based preservation**

Whether or not Jorum and subject repositories will provide a long term solution to preservation, for the present most e-learning materials are kept within the institution in which they were created.

Emmerson<sup>37</sup> found academics in his survey using a variety of storage methods:

*Very few had, or knew about, an institutional repository to which they could transfer materials and most continued to hold material in their Virtual Learning Environment (VLE), on shared network drives, on discs and other miscellaneous storage media within their offices or in departmental storage areas and occasionally 'at home'.*

## **Virtual Learning Environment (VLE)**

The VLE, with its concentration on current teaching and learning materials, is not really appropriate as a vehicle for long term preservation, as the EdSpace project overview points out:

*VLEs have proved to be useful tools in facilitating staff in organising educational resources and activities in a hierarchical structure representing the structure of programmes and modules. However, while they are excellent vehicles for delivering materials, they are not in themselves ideal mechanisms for managing and curating materials. What we require is a repository of educational materials that can be used to populate VLEs*<sup>38</sup>.

## **Institutional Repositories for Learning Objects**

The learning object repository (LOR) could be said to provide a better home than the VLE for those learning objects that are to be preserved on a longer term basis. Yet few institutions have set up learning object repositories or have included learning objects within their institutional repository. As has been noted previously, one could

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<sup>35</sup> [http://www.academy.gcal.ac.uk/cd-lor/documents/CD-LOR\\_Structured\\_Guidelines\\_v1p0\\_001.pdf](http://www.academy.gcal.ac.uk/cd-lor/documents/CD-LOR_Structured_Guidelines_v1p0_001.pdf)

<sup>36</sup> <http://www.nln.ac.uk/>

<sup>37</sup> Emmerson, P(2008) Retention of learning materials: a survey of institutional policies and practice. <http://ie-repository.jisc.ac.uk/149/>

<sup>38</sup> <http://www.edspace.ecs.soton.ac.uk/overview/index.php>

argue that pressures on institutions to make their research output available for the Research Assessment Exercise (RAE) and its successor the Research Excellence Framework (REF), plus the institution's own desire to publicise the research of its academics has led to the growth of the research repository, while no similar impetus has driven the growth of the learning object repository.

The WM-Share project<sup>39</sup> investigated the use of online repositories for learning materials to be shared among project partners, and produced guidance notes for those setting up a LOR. The JISC briefing paper<sup>40</sup> makes the case for managing e-learning materials within repositories rather than VLEs, as an extension of the informal sharing done by academics now.

There are a few examples of research repositories which also include other material. DSpace@Cambridge<sup>41</sup>, for example, contains 'digital content of a scholarly or heritage nature', allowing material of historical significance to be shared and preserved. Through JISC projects and other funding, a few learning object repositories are now being set up in the UK. Examples include:

- EdSpace (University of Southampton)<sup>42</sup>

The EdSpace project is funded under the JISC Institutional Exemplar programme. Its aim is to build up a separate learning objects repository (EdShare) using the same EPrints software as Southampton's research repository. It aims to change culture by encouraging sharing and will make use of social Web 2.0 tools with opportunities for adding ratings and comments.

- Digital Learning Objects Catalogue (University of Glamorgan)<sup>43</sup>

The Digital Learning Objects Catalogue (DLOC) originated from the EU funded project for E-College Wales (ECW) and was developed from online learning course modules. It aims to provide free access within the institution, where academics can go through and select material which is then made available to students through the VLE.

- CURVE (University of Coventry)<sup>44</sup>

CURVE (Coventry University Repository Virtual Environment) is being developed with the aid of JISC funding under the Repositories Start-Up and Enhancement (SUE) programme. It will include learning objects as well as archival and research material and is based on The Learning Edge's Equella repository system.

The association of CURVE with CIPeL (Centre for Interprofessional e-Learning)<sup>45</sup> with their strategy for the reuse of learning objects<sup>46</sup> has meant

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<sup>39</sup> <http://www2.worc.ac.uk/wm-share/>

<sup>40</sup> JISC (2008) Managing and sharing e-learning resources: how repositories can help.

<http://www.jisc.ac.uk/publications/publications/elearningrepositoriesbpv1.aspx>

<sup>41</sup> <http://www.dspace.cam.ac.uk/>

<sup>42</sup> <http://www.edspace.ecs.soton.ac.uk/>

<sup>43</sup> <http://celt.glam.ac.uk/Support-Resources/digital-learning-objects-catalogue>

<sup>44</sup> <http://cuba.coventry.ac.uk/curve/>

<sup>45</sup> Add ref

<sup>46</sup> CIPeL(2008) Reuse strategy, version 0.2

[http://cuba.coventry.ac.uk/curve/files/2008/05/ur\\_reuse\\_strategy\\_v021.doc](http://cuba.coventry.ac.uk/curve/files/2008/05/ur_reuse_strategy_v021.doc)

that this service has had an emphasis on reuse from the start. CIPeL is a CETL (Centre for Excellence in Teaching and Learning) led by Coventry University and has a large collection of learning objects in the health area which are available through CURVE. A Dance Archive (Siobhan Davies Dance Online)<sup>47</sup> is also being included.

## Open Educational Resources (OER)

A further development relevant to a study of preservation is the growth of open educational resources of which the most prominent example in this country is the Open University's OpenLearn<sup>48</sup> and in the US MITOpenCourseware from Massachusetts Institute of Technology.<sup>49</sup> OpenLearn was set up in October 2006 and gives free access to some OU course materials to learners anywhere in the world

The JISC POCKET project (Project on Open Content Knowledge Exposition and Teaching)<sup>50</sup> led by the University of Derby with the Open University, Bolton and Exeter Universities, is building on the OpenLearn approach and extending it to other HEIs.

A new HEFCE initiative<sup>51</sup> 'Opening up resources for learning' will fund pilot projects to be run in partnership with the HEA and JISC, designed to open up education resources to the world and including an encouragement for sharing and reuse:

*As a result of this agreement institutions will be encouraged to share and reuse learning content - enhancing productivity for educators and students. Ultimately we hope that learning materials and resources will be shared universally - locally, nationally and globally, to support learning.*

## 4.6 Preserving web resources

It is likely that many academics keep material on individual or departmental web-sites where preservation will depend on policies and practices within the individual institution. The JISC PoWR (Preservation of Web Resources) project<sup>52</sup> is running workshops and producing a handbook with advice on the preservation of institutional websites. Though not directly addressing e-learning materials, it is successfully raising awareness of the problems of preservation of web material.

## 4.7. Web 2.0 developments

While it is not the purpose of this study to look in detail at how Web 2.0 developments are likely to impact on the development of e-learning in higher and further education, it is important to recognise a potential shift towards social networking which will affect the way e-learning materials are stored and therefore

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<sup>47</sup> <http://www.coventry.ac.uk/researchnet/d/282>

<sup>48</sup> <http://www.open.ac.uk/openlearn/home.php>

<sup>49</sup> <http://ocw.mit.edu/OcwWeb/web/home/home/index.htm>

<sup>50</sup> <http://www.derby.ac.uk/pocket>

<sup>51</sup> <http://www.hefce.ac.uk/news/hefce/2008/os.htm>

<sup>52</sup> <http://jiscpowr.jiscinvolve.org/>

their curation and preservation. This is recognised in the final review of the JISC/HEA Benchmarking and Pathfinder programme:<sup>53</sup>

*...in discussion across the programme, we see an emerging awareness that the VLE-driven approaches of recent years are increasingly out of alignment with the changing expectations of students..... Student expectations will increasingly set the agenda for institutions. The VLE era has not in general led to a culture shift in teaching methods but academics are increasingly squeezed between the demands for a more student-centred form of teaching on the one hand and pressures from the social networking generation of learners on the other*

Franklin, in his study for JISC on the use of Web 2.0 technologies for learning and teaching<sup>54</sup> identifies a number of issues relating to the growing use of Web 2.0 systems within higher education:

*The introduction of Web 2.0 systems into HE is not without problems, as there are ramifications in the areas of the choice of types of systems for institutional use; external or institutional hosting; integration with institutional systems; accessibility; visibility and privacy; data ownership, IPR and copyright for material created and modified by university members and external contributors; control over content; longevity of data; preservation; information literacy; staff and student training; and appropriate teaching and assessment methods.*

As this list indicates, there are challenges here for decisions on preservation, whether using external or internal Web 2.0 systems. Using external hosting poses particular problems for continuity of content:

*A service could be terminated at any time (possibly without warning) leading to loss of content which has not been backed up.*

*Back-up facilities, procedures and responsibilities for externally hosted services are an area of concern.*

There are also particular issues with versioning. If wikis, blogs etc are to be preserved, how are decisions made about which version of a dynamic content should be preserved?

## **5. Attitudes to preservation: the community view**

The following section draws on the feedback gathered from the community and presents the attitudes to some of the key issues around preservation which have been identified through the review of resources. In addition to responses gathered for

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<sup>53</sup> Higher Education Academy (2008). Challenges and realisations for the Higher Education Academy/JISC Benchmarking and Pathfinder programme.

[http://elearning.heacademy.ac.uk/weblogs/pathfinder/wp-content/uploads/2008/09/Bench\\_and\\_PathFinalReview20080926.pdf](http://elearning.heacademy.ac.uk/weblogs/pathfinder/wp-content/uploads/2008/09/Bench_and_PathFinalReview20080926.pdf)

<sup>54</sup> Franklin, T. (2007) Web 2.0 for content for learning and teaching in higher education.

<http://www.jisc.ac.uk/media/documents/programmes/digitalrepositories/web2-content-learning-and-teaching.pdf>

this study, it also includes relevant comments from those who took part in the Jorum external evaluation in 2007.<sup>55</sup>

## 5.1 The case for long term preservation: user views

As has already been suggested, the low response rate to this and similar surveys on preservation may in itself indicate a low level of interest. The majority of those taking part in this study queried the need for e-learning materials to be preserved on a long term basis. Some of the reasons given are explored below. .

### Why treat electronic and printed teaching materials differently?

Some respondents queried why we should be considering long-term preservation for e-learning materials when this had not been considered necessary for print materials used in teaching:

*E-resources have been raised to a status above ordinary teaching materials.*

*Interesting to get opinions of teachers first hand, but need to do it carefully and not just about e-learning materials. Do they use any materials more than 5-10 years old e.g. textbooks, then ask about materials delivered electronically*

*Do we have the equivalent for print materials e.g. the handout photocopied a hundred times?*

One interviewee, however, put a counter-argument, that print material was more likely to have been preserved in the past and that digital material could more easily be lost:

*It is likely that [preservation] was more common with print material in the past and that with digital material it is easier to lose and destroy and also more expensive to find and then reformat in a way that can be read years later.*

### Suitability of teaching materials for preservation

Following on from the argument that there should be no difference in the treatment of print or electronic teaching materials, some interviewees made the point that the quality level of much teaching material might not justify its long term preservation:

*A lot of teaching material may have been churned out on day one of the course and stayed the same for 10 years so is not good quality. A digital preservation environment might expose that even more, so might be a driver against preserving things.*

One respondent emphasised the distinction to be made between 'handouts' and 'textbook quality' material:

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<sup>55</sup> Halliday, L.(2007). Jorum external evaluation report.  
[http://www.jorum.ac.uk/docs/pdf/070717\\_JorumExternalUserEvalFinalJC.pdf](http://www.jorum.ac.uk/docs/pdf/070717_JorumExternalUserEvalFinalJC.pdf)

*One of the reasons teachers say they don't keep material is because it's not particularly good – if they are creating high quality material it would be different i.e. do you see electronic materials more as textbook quality than as handouts? People will be informed by their own experience and most of that is of low quality.*

There is clearly a distinction to be made in terms of preservation between high quality materials and those more ephemeral materials produced for class use. The question of suitability is also generally related to the actual time and effort that have been spent on its creation, a point which is considered further in section 5.3.

## **Concentration on building up content**

One possible reason for lack of interest in preservation is the present concentration on building up content rather than preserving it. The need to build up content was emphasised by some respondents:

*I think even just getting the VLE up and running at this stage and content is the main driver rather than worrying about what to do with the content further down the line.*

## **Lack of recognition for e-learning**

Lack of interest in preservation was therefore linked to questions over the suitability of much learning and teaching material for preservation and a perceived lack of high quality content. One possible reason for this was the lack of incentive to produce such materials, arising from a lack of recognition given to those who produced them. This was seen to affect both the quality and the quantity of e-learning materials:

*There is no real incentive to share that kind of stuff there is no credit, no reward for it, people do tend to view it as their personal material even though technically its not.*

*The university has a strategic plan to increase its reputation for applied research. There's no such pressure to produce e-learning materials. ...until there is more recognition you will just get enthusiasts, usually the same people.*

Comments made by other respondents in respect of Jorum emphasise the same point:

*There's no recognition for academics who contribute to external repositories*

*The advantage is [Jorum's] free, but there is no academic recognition of learning objects.*

*People are reluctant to contribute, they don't have the confidence and they don't have time*

This point about the lack of recognition for contributors was made by several respondents and from these replies could be said to be one of the reasons for lack of content, and hence lack of interest in preservation. One respondent suggested a link to the HEA with some reward scheme for learning objects as a means of increasing high quality content.

Unlike research materials, where there was considered to be more of an incentive to make materials available through institutional repositories, there was no mandate or requirement for e-learning materials to be deposited, apart from the JISC requirement to deposit relevant outputs from JISC funded projects in Jorum. At least one respondent felt that such a mandate would encourage content and so promote the need for preservation:

*If it becomes a condition of a funding body to be preserved then maybe that would make some preservation occur.*

## **Rights issues and IPR**

A few interviewees cited rights issues and IPR as a barrier to the preservation of e-learning objects. One interviewee questioned whether the creators of learning objects were in favour of them being preserved, or whether there were too many digital rights issues for this to be considered. Another also saw rights issues as an important consideration:

*Question of IPR – who do e-learning materials belong to? Would there be more sharing if there were no copyright issues? How much is it yours if you reuse?*

Finding out about rights was seen by another interviewee as a potential problem in long term preservation. Particularly when a consortium of institutions had been involved, establishing rights when staff had retired and there was no-one available who remembered the original was particularly difficult.

Another respondent had found that a good deal of work was needed to establish rights, often because those responsible for the particular website where objects were located were not sure themselves, as rights had not been considered when content was developed.

*Once it becomes formal they are more reluctant, not sure if they have responsibility to sign, what are the rights involved e.g. if others have developed some of the content.... People have developed content but not considered rights.*

This leads to the question whether the effort of establishing rights is worthwhile:

*It has highlighted the effort involved. It would have been a lot easier to create new content from scratch.*

In relation to Jorum, one respondent felt that IPR was a deterrent to getting contributions in an external rather than internal repository:

*The University is lukewarm – it doesn't deposit in Jorum because of IPR. We prefer to have materials in our own repository where we control access*

Establishing rights issues at the start of the process and with a clear statement on IPR would therefore seem a prerequisite for encouraging preservation.

## General lack of interest in permanency

A few respondents felt that there was no point in being concerned about preservation when students' interests and social networking sites were constantly changing:

*Young people create and modify, interest is in the here and now.*

*The idea of Facebook etc is that nothing is permanent. Look at SecondLife - its never going to be an archive, everything gets rebuilt, not about permanence, but then a lot of education's like that.*

## 5.2 Making decisions on preservation

As was shown in section 4.3. there were some instances where the literature suggested that e-learning materials should be preserved. These were:

- Continued use of the original learning object
- Future pedagogical interest
- Future historical interest

Community views were sought on attitudes to preservation in each of these instances and replies are reported below.

### Continued use of the original learning object

Some respondents felt a case could be made for preserving some types of material:

*The academic content may have a longer lifespan depending on what it is about. If it is a bit of fundamental maths for example the content is unlikely to date.*

Members of the Jorum focus group similarly felt that the need to preserve might vary by discipline, for example social sciences and law materials may change frequently while materials for other disciplines such as biology may remain relatively unchanged.

While acknowledging that a case could be made for preserving a certain amount of material on this basis, the predominant view was that such material was limited and for most e-learning materials long term preservation was not appropriate:

*Some things are timeless, for example a set of questions you may ask, those will go on, but anything of the moment needs to wither*

*VLE modules develop over time and the way modules are taught varies, so these materials are more dynamic. For research interest, we need to consider sustainability but this is just a fraction of use.*

### Pedagogical interest

There was some recognition of the possible value of preservation for pedagogical reasons:

*Where will future generations get the evidence on development of e-learning materials?*

*As a record of particularly good or bad practice to help future educationalists understand the current state of learning and technology*

*Can see potential interest to researchers in pedagogy –we learned a lot from developing e-learning materials*

*Potentially anything has a long term interest historically. There are lots of technical innovations over the last 40 years in teaching and learning and being able to reflect on how things have changed would be good.*

One interviewee, however, challenged this attitude, suggesting that if this form of pedagogical research was needed, then it should be identified and funded as such:

*It might be interesting as a research project in which case it should be funded as research. If they think there is a pedagogy research market for that, it's a realistic thing to do ... but if there isn't that research problem then why create the resource data base?*

## **Historical interest**

In addition to possible pedagogical interest for future researchers, it was recognised that some content may itself be of lasting value. Making decisions on what history would regard as important was, however, particularly difficult, as several respondents pointed out:

*Possibly a Nobel prize winner's learning objects might have some historical importance, but would it be worth saving? It is really the speaker not the content that is important. Also you might not be able to tell this at the time who might be famous or important, which means you might need a link through publications database and some form of audit trail but at the moment with all these siloed repositories it is difficult to do.*

*If someone won a Nobel prize then all their notes would be of value, but how would you know in advance? In the past things like this have often been saved for two reasons 1. 'Benign archiving' – basically saved by accident or 2 the individual has obsessively kept all their materials.*

## **Selecting materials for preservation**

As the above sections indicate, even while acknowledging that certain types of e-learning object could be preserved, the community's views confirmed that it was considered that difficulties remain about how such materials should be selected.

Some respondents felt that because digital storage costs were low all materials should be preserved:

*All academic materials should be preserved. Digital storage is cheap (in comparison to library shelf space).*

*There might be an argument that if you can manage teaching materials centrally then it should be cheapish to hang onto this stuff for 20-30 years*

*which then gives enough idea of whether it is likely to be of historical importance*

One respondent from an HEA subject centre similarly made a case for continued access to all materials:

*We think there is almost always a good reason to keep resources available via a public URL, even if they are strictly "out of date", they may be useful in creating new resources that are current, or in studying how teaching has changed over time.*

A similar view was expressed by some members of the Jorum focus groups, who suggested that there was no need to dispose of anything when digital costs are low and falling, and that it was valuable to preserve all content as a record of online teaching in this period.

There was a much more widely held view, however, that deciding what material need not be kept was more important than deciding what should be preserved:

*We are drowning in information. There's just too much. A vast winnowing may be more helpful*

A similar view was expressed in the Jorum focus group:

*I think increasingly the issue is how to get rid of stuff that's just out of date.*

This view that out of date material should not be kept in the long term was emphasised by other respondent who felt we should acknowledge the limited life of much e-learning material:

*Many e-learning resources have a finite shelf-life. The world changes; key questions change; the teaching of knowledge and practice needs to change too, and it is almost more important to throw away old stuff as it is to preserve it.*

*But my view is that life-spans are generally short, for a number of reasons, except in specific disciplines where, for instance, the subject material is historic. Even then the idea of preservation is only relevant to the 'core' content around which e-learning material may be built. Changes in curriculum and turnover of staff mean that new ideas of how the subject should be treated reduce the life of the more sophisticated materials.*

*To my mind there is a difference between short term preservation for evidential and accountability reasons (for instance to preserve student coursework, discussions etc) and actually archiving materials as a record of particularly good or bad practice to help future educationalists understand the current state of learning and technology, or perhaps as a building block for future material.*

The predominant view was that possible future value should not be regarded as a reason to keep everything, just in case it was needed later. Positive decisions on selection were needed to avoid too much material being kept:

*There's a danger that repositories can get filled up with all sorts of nonsense*

*And of course a real danger is that if you have all this content in your VLE or wherever, then a learning repository, then it becomes another silo and information is not being looked after in the wider sense.*

A similar point was made by a Jorum focus group member:

*Can you find the needle in the haystack? If there's 20 years of rubbish material because it's out of date, why are you keeping it? It means that that one beautiful resource that is there ... isn't found*

The fact that virtual storage space was so cheap compared to the space needed to house books or paperwork was seen by some as a disadvantage, encouraging the keeping of everything rather than having an active selection and disposal policy. Some interviewees compared the situation in libraries, where academics were reluctant to see books thrown away:

*We're not good at deleting and throwing away –even learning technologists don't like throwing away – they put it in an 'unavailable' space like a black plastic bag in virtual space. Worried someone will say have you got x and shout at them. If not used for 3 years why should you keep it?*

*A lot will be lost, you can't preserve it all – someone will grind their teeth but that's tough. Academics are very obsessive about preserving everything.*

There was therefore a general consensus that while some materials may be of long term value, it was equally important to have a selection process and that keeping everything, even if storage costs were low, could be counter-productive.

### **5.3 Possible reasons for preservation**

Respondents provided some possible reasons why e- learning objects should be preserved.

#### **Access more important than preservation**

Accessibility or continued usage was generally seen as of more importance than archival preservation. :

*Our interest is in making things available rather than preservation*

*Long term viability of learning objects will be to do with making them readily accessible in logical fashion where people can find them and they have some value.*

One respondent made the point that just because objects could be preserved, it did not follow that they would then be accessible:

*Is it really about preservation or access? Anyone can preserve their own stuff e.g. in a pc system back up , but really the preservation is more about providing access to other people.*

It is therefore important to bear in mind that the main reason for the preservation of e-learning materials is to ensure that they remain accessible. Archival storage methods which do not address this aspect will not generally be appropriate.

## Reuse and sharing

Respondents were asked their views on reuse and sharing, which as section 4.3 shows, were seen as primary reasons for long-term preservation.

Most heads of e-learning and learning technologists interviewed for this study were actively promoting examples of good practice, often holding seminars or showcasing particular learning objects, and success was reported in moving more staff from the basic level of uploading PowerPoint presentations to more advanced use of e-learning. Some examples were given of sharing resources, for example accounting and business elements taught to engineering and science students or statistical packages developed for psychology students repurposed for biology. Examples of reuse and sharing, however, were minimal, in spite of this encouragement. Possible reasons put forward for this are explored below.

- **Reluctance to share**

There was a strongly held view that academics were reluctant to share materials:

*If it's good they don't want to share, if it's not good enough they don't want to share, we're caught between two stools*

Some saw this as a cultural barrier to be overcome:

*The mindset... would have to be changed to make preservation and reuse happen*

Some staff from HE felt that FE teachers may be more interested in reuse and sharing, but, although generalisations are difficult from so few respondents, the same view appeared to be held among the small number of FE contributors to this study:

*There's a culture to overcome before learning and teaching materials preservation can be considered. There's a natural disinclination to share*

It must be remembered that respondents to this survey were generally from a learning technology background. It is not certain that teaching staff would hold similar views on the need for a cultural shift.

- **Sharing and reuse between individuals**

Teaching staff were said to regard their material as specialist, offering few opportunities for reuse within a course. It was 'their' material:

*There's still a huge desire to use their own material, it's very difficult to use someone else's material.*

*Teaching materials are about who you are as a professional, professional geographer or historian or whatever, the choice of the readings you put on*

*your course list, the way in which you induct people into that discipline so much to me seems to be about your sense of professional purpose and identity. So to suddenly take somebody else's identity why would you do that?*

In questioning the value of reusing someone else's material, this interviewee also suggested that in most cases it would be easier to create from new:

*Most of the time it's more effort to re-work something than it is just to do it yourself. If you're not really qualified to teach the subject then actually it's probably helpful to get something to start from. But if you know your topic I wouldn't have thought there is a massive need to take the time to re-trace somebody else's material when you can put your own together.*

Another respondent suggested that the ease with which the object could be reused was the important factor for academics:

*When they look at an object if it supports what they want to do they will use it, but they are not keen to repurpose. They would point to it if it was easy, if not they would prefer to create from the start.*

This was considered less of an issue in training, where materials could more readily be shared:

*In training as opposed to teaching there is less of an individual attachment to materials i.e. it is not seen as owned by an individual. It needs of course to be documented well enough to allow someone else to pick up the material and use it.*

- **Sharing and reuse between institutions**

Having e-learning materials freely available in a repository also gives the opportunity for them to be used and reused within other institutions. Some respondents felt there was a particular reluctance to do this:

*Most reuse would be with other institutions as it would be discipline specific but it's part of the intellectual capital of the institution – they are very reluctant to share outside*

*Reuse within the organisation is one thing and reuse outside is another thing. It's another leap I think.*

*Are the faculty convinced that they want to reuse their learning materials? It's all about this is my particular course, if it's all online then why is x's course any different than y's course or whatever?*

*Academics don't look at it from a preservation angle. Universities are different, courses are different, the unique selling point is the teaching.*

Another in acknowledging this reluctance, made the point that MIT having open courseware on the web<sup>56</sup> had not affected its reputation:

*You look at MIT coursework and who cares the stuff is up on the web it doesn't stop MIT being good. Other people might try and nick their stuff but*

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<sup>56</sup> <http://ocw.mit.edu/OcwWeb/web/home/home/index.htm>

*that doesn't make them good either. It might help them along a bit but it won't make or break some other institution, it's like using a good text book.*

The Open University's OpenLearn initiative (see section 4.5) had in fact increased the number of good quality applications from students which can be viewed as an incentive to make such materials available freely. Material is freely available and a number of institutions throughout the world are known to have downloaded material.

In relation to open educational resources, one interviewee felt that a broader view should be taken of reuse:

*If you give people something which is nicely packaged, say how many hours it takes, then people tend not to want to change it. ...you have to take a broad view of what [reuse] means. Some of the literature is dismissive of transfer as a reuse, but I don't think we should be at all. A lot of adjustment about how the material is used takes place in peoples' heads. Its like a book, you don't have to rewrite the book. I think it's overplayed the need for there to be change in reuse.*

It is clear that for those taking part in this study, reuse, sharing and repurposing which are seen in the literature as among the main drivers for preservation are hardly happening at all, in spite of a number of projects which are addressing this area. The question arises whether this lack of activity illustrates the need for a cultural shift, or whether the type of reuse envisaged is simply not appropriate in the teaching and learning context. It is too early to answer this question, and beyond the scope of this study to address it in more detail. In the context of this study, however, it appears unwise to base the case for long-term preservation too heavily on arguments for the benefits of reuse and sharing.

Making content more accessible may lead, as some respondents suggest, to greater and perhaps wider use without substantial reworking. Developments in open educational resources and particularly the new HEFCE/JISC initiative (see section 4.5) will create more freely available high quality content in future. It will be interesting to see its impact on current attitudes to sharing and reuse.

## **Legal and administrative course requirements**

Asked whether e-learning materials should be preserved at the end of the period for which they were originally created and for how long, several respondents linked preservation to the student life-cycle, emphasising that students should continue to have access to the version they had used during their period of study 'in the same way that they'd have access to paper-based handouts and lecture notes'. A distinction was also made between short term preservation for 'evidential and accountability reasons' and actually archiving materials. This approach tied in with that adopted by institutions with preservation policies (see section 5.4) who had generally gone for a 5-7 year retention period, in line with the JISC guidelines for assessment documents described in section 4.3.

As one interviewee pointed out, in terms of compliance only assessment and validation documentation is required and even then it is for a relatively short term so will not be needed 10 or 20 years later:

*The assessment stuff that's really where the litigation is going to be and if they can actually make a case for unprofessional teaching what does it matter what the teaching materials are like?*

Several respondents made a distinction between course materials that need not be preserved longer than the 5-7 year period covered by preservation policies or by current practice and less dynamic materials that may have a longer life:

As noted in the review of resources in section 4.3, if legal, administrative and course requirements, if they are to be applied to e-learning materials at all, may make it prudent to retain these for a period of up to 7 years, but are unlikely on their own to provide a valid reason for keeping materials beyond that date.

## Costs

Some respondents saw cost considerations as a major driver for preservation:

*Finances affect the decision in two ways. First, the more money and effort invested in the development, if the content was wisely chosen, the more inclined I am to preserve it. Secondly, ultimately the storage costs must also be considered, although those are typically small as compared to total development cost.*

*Sustainability = financial. This is wonderful stuff but will we still be using it in five years time if there is no plan for maintaining it, if not why should we be spending resource on it now?*

In recognising the high costs of producing high quality e-learning materials, some respondents felt there would be more pressure for reuse and sharing in the future:

*There's a huge amount of money being spent, where is the tangible benefit? Now there's a requirement for collaborative projects, trying to force sharing.*

*It's a golden age in terms of funding and it's going to get worse. If it's relatively cheap to preserve, then no problem, there will be an urge to preserve if it will be reused.*

## 5.4 Policies and practice

Those in the study were asked whether they had any preservation policies that covered e-learning materials and, whether or not they had formal policies, what approaches they took to deciding what e-learning materials should be preserved.

### Preservation policies

Lack of management strategies which included preservation was seen as a major problem by one interviewee:

*The big problem is that there are no management strategies for learning and teaching materials. – you need policies that will manage a resource through its life-cycle up to the stage of disposal or archiving. There's no point in having a preservation strand without having other management policies. It's an essential part of it.*

Asked if their institution had a preservation policy for e-learning materials, the majority of respondents were not aware of any such policy, one saying that departments were generally responsible for their own teaching materials, and another that VLE materials 'are probably archived somewhere and used for backup purposes and system restore'.

A few examples of preservation policies covering e-learning materials were identified during the study. Brief descriptions of three such policies are given below:

- University A: A six year preservation policy was tied into the six-yearly Academic Review, following an extensive review of retention policies for paper and online materials. This had given better version control now that learning objects were being created directly on the VLE rather than uploaded, and had proved very useful for academics to be able to go back over the life of a course. After six years, materials were kept for a further two years and then deleted, but academics could opt to keep them for themselves, or identify what they then wanted to keep which would go into a separate VLE.
- University B: A preservation policy for a five year period. This was felt to be a common sense approach which avoided misunderstandings. If academics wanted to keep materials for longer, they could do so. Showcase resources might be kept for a longer period.
- University C: All course materials were archived at the end of each semester. Course designers and other academics were encouraged to archive their own materials before deletion. Archived material was then kept for a six year period 'to allow time for appeals and the like to be settled', The policy was based on the JISC Records Retention Schedule relating to institutional records.

One of the respondents who had set up a preservation policy expressed surprise at how little information on such policies was available when he made enquiries of other institutions and of JISC. It was apparent that these policies followed the JISC guidelines in respect of assessment materials and aimed to cover course requirements in the medium term. They did not, however, deal with long term preservation on an institutional basis, such decisions being generally up to the departments or individual academics who had created the material.

## **Roles and responsibilities: who decides?**

As already noted (section 4.4), roles and responsibilities are not always clearly defined. This then raises the question as to who should make decisions on preservation:

*Why should learning technologists have a view on preservation? It's because there is no formal or even informal management policy. Whose responsibility should it be – learning technologist, teacher, librarian, archivist – all have responsibility for what happens to materials and roles are not clear. There are multiple roles so it's difficult to talk about attitudes*

Asked who should be responsible for decisions on preservation, most respondents felt this rested with the individual academic or the department:

*I believe it is ultimately an academic decision and thus rests with the department.*

As noted in relation to preservation policies (section 5.4), decisions on preservation at the end of the agreed period would normally rest with the academic:

*Departments are able to retain records locally, but the central e-learning team is responsible for implementing the archiving policy. If a longer retention period is required, a department will need to contact the central team or take responsibility for the retention of records locally.*

There was, however, a recognition from one respondent that some types of e-learning materials may not be the responsibility of the individual academic:

*Challenging question - when is an e-resource 'public'? Clearly where they are created as part of a joint process - e.g. between academic and central or faculty learning technologist - then they have a life 'beyond' the purely personal domain of an individual academic.*

For some others, it was the learning technologist rather than the academic who was concerned with preservation:

*Academics are certainly not involved here in the preservation of e- learning objects. The academics develop things with us so we would look into anything like that... We work with academics who provide content and we do the functionality of the object.*

Without clear policies on the preservation of e-learning materials, the question of who decides what should be preserved and on what criteria is an important one. As already shown in section 5.2, those taking part in the study felt that a selection process was needed, but the question of who should do the selecting was not clear-cut.

## **Determining value**

Given that to most of those in this study preservation implied that some sort of selection process was needed to determine what should be preserved, respondents were asked what methods they would suggest for determining value.

Usage was seen as one important driver for preservation:

*Whatever teaching staff needs should be preserved. Usage has got to be the driver of what we store*

Closely linked to this was the idea of value ratings. Although presented in the context of Jorum, these focus group members' comments on usage and value can be applied more generally:

*Could you relate it to how often it's used and whether it's given a five-star rating? If something's 20 years old and it's still being used a lot then it's probably worth preserving but if something's been on Jorum for the last 5 years and never been used or hasn't been given very good ratings then it's probably not worth archiving is it?:*

*Given the sheer volume of what's going to be in there, it's probably impractical to keep it forever and you actually want to have some sort of quality yard-stick as to whether things are actually being used... There is that brutal reality that you can't keep everything for ever...*

## **Ease of migrating technology**

It was not the purpose of this study to investigate methods of ensuring the preservation of e-learning materials when the formats used to create them had become obsolete or obsolescent. Nevertheless, the ease with which e-learning materials produced in one format could still be used over a long period was an important factor in looking at attitudes to curation and preservation:

*A big issue though is format maintenance. There's not much point in preserving, say a PowerPoint slideshow, if nobody in 2200 can use PowerPoint.*

Both relevance and technology were important here:

*If you created it 10 years ago, is it still relevant and can you still open it?*

There was a view that the formats used to create the learning object would last about five years, so that preservation only became an issue for those materials needed beyond that date:

*There are areas of learning where the lifespan of the material is short for example 5 years. If the material becomes outdated in 5 years then active effort in digital preservation is not necessary – file formats are likely to last that long so you just need to manage and curate the materials in a shared environment as you might just reuse something.*

Another felt that the current generation of repositories would themselves have a five year lifespan:

*There'll be a problem in 5 years time with the next generation of repositories. What do we do with the current one? 5 years is the lifetime. It's not the problem of getting rid of it but of keeping old format, old generation that is an issue*

One interviewee pointed out that having the object available for only three years was still valid, even where long term preservation was not feasible:

*Functionality has a shorter shelf life than content. However it is still not a case of saying it is not worth doing as even if people get three years out of something it is worthwhile. It all has a built in obsolescence.*

Other respondents drew attention to the importance of planning for sustainability and learning from the mistakes of the past:

*Yes, but provided that they are useful and easily re-usable. Many of the old TLTP project materials were in formats that are probably not accessible anymore*

*The content can be separated from the software, so if software is obsolete we can extract the content. With early developments in 1980s and 1990s content may still be relevant but it is difficult to extract from obsolete software.*

These experiences from the past suggest that if e-learning materials have been selected for preservation, then deciding how they are to be preserved long term has to be part of the selection process. If the costs of extracting the content are too high and too complex, then this must raise questions on the value of long term preservation for any digital object.

## **Preserving the context**

As shown in section 4.4, several writers have drawn attention to the advantages of preserving information on the context of the learning object as well as the learning object itself. For example, any star ratings or comments might be kept, or notes from creators or users on ways they had used the material. Asked for a view on preserving the context of the learning object, two interviewees pointed to the value, and complexity, of capturing this:

*It's technically difficult to keep the added value. Depends on the resource. If it's a tutorial package it's OK, but sometimes it's the resource and the way it's being used that's valuable. Contextual use – how do you capture this? You might have a resource then don't know what it's used for –you have to look for evidence*

*It's contextualisation and use and interpretation which is all part of professional judgment which makes it archivable and you can't really capture that contextualisation because the situation is specific, so what about it would you capture?*

The above views suggest that if consideration could be given to ways of preserving the context with the learning object itself this would make it more likely that the object itself would be used or reused in the future.

## **5.5 Where should e-learning objects be preserved?**

In considering attitudes to preservation, it was considered important to establish where e-learning materials were currently stored, as different policies or practices may affect approaches to preservation. Respondents were therefore asked to describe how e-learning materials were made available within their institutions. Sources mentioned were:

- VLEs
- Institutional and learning object repositories
- Local web pages
- External services e.g. SecondLife, wikis, blogs
- Jorum and other national/regional or subject repositories

Each of these is discussed separately below, as the implications for preservation will depend on where e-learning materials are stored and how they are accessed and used.

## Virtual Learning Environments (VLE)

The VLE was the main place where e-learning materials were stored according to those who provided input to this study. This was generally a central institutional VLE, though some institutions had separate faculty VLEs. Some had taken active steps to encourage contributions, including creating a more open environment or publicising examples of good practice.

For most respondents, access to material in the VLE was generally restricted to those within a particular course or department. Some of those in the study made the point that lack of accessibility was one of the factors that made the VLE unsuitable for long term preservation and reuse:

*The VLE is not a suitable resource for sharing and preserving as content is not freely accessible even within the institution. We want to know what we are preserving – only a handful know what's in Blackboard. We need a learning objects repository for that*

A few institutions had taken active steps to make at least some of their VLE content more accessible within the institution. Some others had created a special area of the VLE where examples of good practice could be made accessible to all.

As described above (section 5.4), only a few universities had preservation policies for e-learning materials, generally covering a period of 5-7 years. Other universities in this study described how earlier versions of the VLE may be archived, either as a back-up, or to create an audit trail in case of possible challenges by students. Whether using formal or informal approaches, these approaches were intended to deal with preservation in the medium term in line with the JISC guidelines.

For most respondents, material in the VLE was considered as owned by the person who created it, which allowed teachers to retain control over their material.

*All sites within the University supported VLE are preserved each year, so at the start of the new session a new 'instance' of the site is created, based on the content from the previous year. In this sense the e-learning materials are preserved, however, staff are at liberty to edit/delete/remove this content as they see fit.*

## Institutional repositories for learning objects

Some respondents felt the solution to preservation was an institutional repository system where e-learning materials could be permanently stored. This was felt to be a means of promoting re-use and sharing (see section 4.3 on reuse). For this, a distinction needed to be made between more transient course modules and courses that remained relatively fixed over a period of years, which 'needed to be created in a sustainable manner that could be preserved'

Some institutional repositories in higher education have been set up to deal with learning objects as well as research output, though the number of learning objects is generally small and the main driver has been research output.

*In the HE sector I think the current whim is looking at research data and also research papers. They are motivated by the funding and credibility in this area which drives it so the resource and effort is being put here.*

Those repositories that had been set up expressly to include learning objects, such as EdSpace, the Digital Learning Objects Catalogue at the University of Glamorgan and CURVE (see section 4.5) were at an early stage and the concentration so far has been on gathering content rather than considering long term preservation. However, it was recognised that the sort of learning objects which would go in a learning object repository were likely to be those more worthy of longer term preservation than those within the VLE, a distinction made by respondents who had access to an institutional learning objects repository:

*Some material ages so rapidly that keeping it is irrational, but good material could be extracted into the Learning Objects catalogue*

For the CURVE repository (see section 4.5), for example, staff were encouraged to deposit material in the repository rather than the VLE unless it was of a transient nature. If the material was likely to be used again, either by the original user or another, then it needed to be located where it could be shared:

*The concept of sharing in the tutor's mind determines where it is put – you don't need to share it with anyone else to share it – you can share it with yourself e.g. if you are going to use it in other modules or in other years.*

By offering three levels of 'discoverability', the CURVE repository will make materials accessible without individual academics losing control of how they give students access through the VLE to current course material stored in the repository. The repository will offer safe storage and IPR control. Archival collections within the repository are freely accessible using the Creative Commons licence.

The CoRE repository system used by the WM Share project had recently been set up by an FE respondent to the email survey, though as yet contained only external materials until copyright policy had been developed. Another FE College had recently set up a DSpace repository as a pilot project with both public and restricted areas, linking it to the College's VLE system and depositing material intended for longer term preservation.

One advantage of placing objects in a learning objects repository or in an open educational resource is the very fact that it will be preserved. The OpenLearn service, as one respondent explained, was set up with preservation in mind:

*This has been partly a preservation issue for us – how do we enable the world to get some value out of our high quality stored learning materials? The reality is that we are not going to resell it, we are constantly making changes, so we're actually putting it out to the world as a way of preserving things that would otherwise be lost.*

Some material in the OpenLearn service will be labelled as archived, but the intention is to put a positive note on preservation:

*It's a way to use preservation to offer new opportunities rather than simply as a way to keep things.*

## **Local web pages**

Most institutions reported that learning materials could also be found on individual academics or departmental web pages.

*All over the place – much on academics' own websites.*

*The libertarian spirit is very much alive*

It was recognised that such pages often came from a desire to make materials more accessible outside than was possible within the VLE, yet most institutions now were working with academics to transfer e-learning materials into a central location where they could more readily be accessed and possibly shared. While academics would generally keep their own back-ups of e-learning materials, there was a vulnerability in having materials created and maintained just by one academic outside the central system. One respondent felt that the more collaborative work encouraged by Web 2.0 developments might itself ensure that such local web pages were preserved.

## **Jorum's role in preservation**

There were few Jorum contributors in this study, and though most had heard of Jorum, few were active users. Those who were users were asked whether they felt Jorum had a role to play in the preservation of e-learning objects and whether e-learning materials should be preserved in Jorum in the medium to long term, and for how long.

One respondent who had contributed content to a commercial repository that had since disappeared emphasised strongly the need for sustainability and saw an important role for Jorum in ensuring continuing access:

*This work is critical. For around 4 years .. I worked to contribute to the development of the HLSI project. A considerable amount of public funding was allocated to this project and to the best of my knowledge, the resulting repository technology and learning content have all been lost. The developments from the project should have been maintained by the public sector to ensure its long term sustainability and security....[Jorum] should be free indefinitely with long term vision, not here today, gone tomorrow.*

Another saw the value of an archive for Jorum and suggested how objects could be selected:

*If Jorum is to be a national repository, then perhaps it should have an archive. Best thing would be to have review area where you put things you propose to withdraw. If anyone objects they could be kept in a holding archive say for 5 years.*

One respondent used the argument that disk storage was cheap to suggest there was no need to make a decision on what should be preserved, although did suggest a filtering system to weed out older material:

*Why not continue to preserve it? Disk storage is so cheap these days that it seems more effort to make a decision about what should be deleted. So long as people can choose to filter their searches and ignore resources more than (say) 5 years old.*

A Jorum focus group member felt that a Jorum archive may act as an incentive to both users and contributors:

*Ask us in 10 years! That's the problem, isn't it? We don't know it's valuable until it's missing... It could be an incentive to use Jorum... the pay off is that if you want to find something ... you might think 'now I did produce something for that group in 1987, now where the heck did I put it? Oh, I'll just have a look in Jorum'. You can do that now with the web.*

One saw a future for Jorum if objects were to be reused or repurposed:

*For repurposing content, we need to think in terms of repositories for learning objects. The actual object may not last, but someone else could take it out of Jorum, acknowledge its original owner and embed it in their own text. The original object may not last, but there could be 100 instances of it being used in a different way.*

A further respondent drew attention to the possible danger of having a number of different repositories and the advantage of Jorum as a central service:

*I would like to see a continuation of the consolidation of content into one large service repository. The sector needs to keep things simple and give staff as few places to look for resources as possible.*

The number of replies from Jorum users was too small to provide a clear view on this issue.

## **Subject repositories**

A few respondents felt that subject repositories would be the best place for preservation:

*A Jorum archive could be useful, but only if people want to use it. Subject networks may be better for preservation. Jorum is so big why should I go there? Academics relate more to subject areas.*

One suggested that the HEA subject centres could encourage more reuse:

*Academics will support the subject centres as they interested in learning objects in their area. They prefer relevant to generic material. It would be useful for subject centres to bring people together to re-use materials.*

A number of the HEA Subject Centres provided some e-learning materials on their websites. Some of those contacted for this study were in fact working with Jorum to make their materials more accessible to a wider audience:

*We opted to use Jorum in an attempt to widen access and maintain a stable platform for the materials.*

The following approaches to preservation were described by HEAs contacted:

*When a major update is called for we may contact the author to re-write their material. As yet no materials have been removed, although they may be marked as 'archived' if appropriate. The Information Manager is responsible for developing and executing this policy.*

*There is no general policy: We consider each resource on an individual basis. We have small quantities of high quality material and this approach is sufficient for us at this stage.*

As with other types of repository, it was apparent that given the current amount of content in these repositories, preservation had not yet become an issue to consider.

There was also the view that long-term preservation was dependent on future funding of the subject centre projects which produced the learning objects:

*Ideally we want our resources available in perpetuity, although naturally we cannot guarantee this because we cannot guarantee that our project will always have funding.*

## **External Web 2.0 services**

Asked how they felt Web2.0 would change e-learning materials and how they were preserved, most respondents spoke of use of external services such as SecondLife and externally hosted wikis or blogs. These freely available services were generally felt to be better than those provided by the VLEs, and there was usually support for having staff experiment with such services. One interviewee felt claims that Web 2.0 had a role in preservation were false:

*It's said that Web 2.0 contributes to the preservation of data, but I don't agree. It makes it available but doesn't preserve*

Some expressed concern at lack of institutional guidelines for their use, and a recognition that the institution would have no control over preservation, with concerns also over reliability and IPR.

*Being outside the institution's control would be a problem if you wanted to archive. You can't archive, would have to copy and paste into own archive.*

*For developing online content it's important to have different formats. There's a risk things from external sources could be pulled, but academics should always have backups, e.g. using variety of material so not relying entirely on one source.*

One interviewee pointed out how commercial developments can quickly overtake in-house systems:

*The functionality aspect can get quickly superseded. For example the tool we developed has basically been superseded by Google maps and another tool has been superseded by You Tube annotations. .. these systems are much more ubiquitous and therefore more attractive to use than getting people to use my system anyway*

Another respondent felt that the growth in content which could stimulate demand for preservation and potential reuse would come rather through social networking sites than through repositories:

*The most significant driver is going to be growth of materials. However, I'm not sure that formal repositories will be the biggest sources of shared material - I can see things like slideshare, youtube and facebook becoming important*

*sources of learning materials for many people. ...Also, the growth of wiki software may have an effect on the use of reusable materials, although I think that's hard to quantify at present.*

Web 2.0 and social networking sites are a growing area that presents challenges to the established methods of making e-learning materials accessible. While making materials more accessible, there are questions about control and implications for preservation that require further study.

## 6. Conclusions

From the responses to this study the following conclusions can be drawn.

1. There appears to be only limited interest in long term preservation of e-learning materials. Many of those in the study felt that there was no reason to treat e-learning materials differently from other types of teaching materials which generally had a limited life. This may be because of the lack of high quality materials that justify preservation, due possibly to a lack of incentive to create such materials, unlike the situation with research output. Rights issues and questions of IPR might also discourage preservation. It is recognised also that for many the priority has been on building up e-learning content, and institutions may not be ready to consider preservation. Although in terms of preservation the ideal would be to consider preservation early in the lifecycle of any e-learning material it is unlikely that in the relatively immature e-learning landscape this will happen.
2. While acknowledging the case for the preservation of some e-learning objects for their pedagogical interest or historical importance, there was a strong view that this should be done on a selective basis and not used as an excuse to keep everything just in case it was needed in future. In this context, the cheapness of digital storage can be seen as both an advantage in facilitating preservation and a disadvantage in encouraging a lack of selection and contributing to information overload.
3. In looking at possible reasons for preservation, those in the study were keen to stress that continued access was more important than archival preservation. In addition, there was little evidence from those who provided input to the study that much reuse and sharing of e-learning materials was taking place. This is noteworthy when one considers that both the literature and the respondents to this study felt that reuse and sharing of e-learning objects would be one of the main drivers for longer term preservation of such materials. There was generally considered to be a reluctance to share materials whether within the institution or outside it. This was seen by some as a cultural issue where a change of attitude was needed and some projects were now addressing this aspect. The development of more open resources may contribute to a change in attitude in future, but from the results of this study it is difficult to say with any certainty that reuse and sharing are seen by the community as primary drivers for preservation.
4. There may be a case for retaining e-learning materials for a period slightly longer than the lifetime of a particular course in case of legal disputes or to suit administrative requirements. This was, however, considered less necessary than preserving assessment documentation and did not provide a valid reason for preservation beyond a period of 5-7 years.

5. The costs of producing e-learning materials were seen as a major driver for their preservation and a possible argument for future reuse and sharing
6. Few institutions have preservation policies that cover e-learning materials. Those that did generally followed the JISC guidelines for assessment documentation and did not cover long-term preservation.
7. There was a lack of clarity over roles and responsibilities for the selection of e-learning objects for preservation. Some respondents felt this should be left to the academics who had created the materials, others that it was the responsibility of the learning technologist.
8. Methods of determining which objects should be preserved long-term included usage levels over time and value judgements.
9. Most e-learning materials were considered to have a five year life span. Beyond that, the software and hardware used to create them would be obsolete or obsolescence.
10. The cost and complexity of changing formats needed to be taken into account in relation to preservation, and ideally decisions on what should be preserved should be made at the start of the process, so that preservation procedures should be agreed in advance.
11. There was considered by many to be a value in preserving the context as well as the object itself, in particular any information of its value and how it had been used. Again, procedures for recording the context needed to be set up in advance.
12. Within institutions covered by this study, most e-learning materials were stored in the VLE, which had a number of drawbacks in relation to long term preservation, notably its lack of wide accessibility and need to concentrate on current material. Those institutions that had set up learning object repositories were at an early stage of development and had not yet directly addressed the question of preservation, but felt that these provided a safer and more accessible environment for those e-learning materials that were worthy of long term preservation.
13. A few institutions had set up completely open educational resources that made some of their e-learning content widely accessible. It was not yet certain what effect these would have on future reuse and sharing, though they were contributing to making resources more widely accessible.
14. Some institutions still had material on local web pages, though there was a move away from these towards the VLE or the repository, and a recognition that preservation would be an issue if the individual member of staff who had created the pages left.
15. Jorum was seen by some to have a role in preservation, possibly with a separate archive facility.
16. Subject repositories run by the HEA Subject Centres or other bodies were considered by some in the study to be more likely to be used by academics.

Though several Subject Centres had such repositories at least for their own project material few appeared to have policies for preservation.

17. The use of external Web 2.0 services was often encouraged within institutions, as commercial products appeared to offer a better service than versions within the VLE. It was recognised, however, that the institution would have no control of long term preservation of any e-learning materials developed in this way.

Overall, it would appear for a variety of reasons that there is limited interest and activity from the community in the area of preservation of e-learning objects as they are defined in this study. It is however hard to draw strong conclusions about the whole of the sector due to the small number of responses. Despite this there are some projects working on reuse of materials and related topics and although it is early days their outcomes may contribute to changing attitudes and assist in strengthening a case for the preservation of e-learning materials. It is also possible that over time attitudes and practices may change. One of the main questions for the future is whether the general attitudes noted in this report are likely to remain or whether the curation and particularly the preservation of e-learning materials is as yet an immature area which may over time become more important.

## 7. Recommendations

1. JISC should work with the HEA and other appropriate bodies to consider how to further encourage the development of high quality e-learning materials which were suitable for long term preservation.
2. JISC should issue guidelines to institutions on factors to consider in selecting objects for long term preservation and should consider extending its current set of guidelines for assessment documents to cover certain types of e-learning materials, giving examples of good practice drawn from the community.
3. Further work should be done to determine how likely it is that e-learning materials will be re-used and shared and how important this should be considered as a driver for preservation.
4. Wherever possible, decisions on preservation should be made at the time of creation of the learning object, so that preservation methods could be identified for those objects that were likely to be kept beyond a five year period.
5. The progress of learning object repositories and open educational resources now being developed should be monitored to see whether they offered significant advantages over the VLE. If they are found to offer advantages, there should be encouragement for more institutions to develop these either separately or as part of their institutional research repository.
6. Jorum should consider the implications of setting up a separate archive service and should liaise with subject repositories to see if their material could also be made available through Jorum
7. Further research should be carried out on the use of Web 2.0 within institutions and the implications of this development for long term accessibility and preservation.