

The DigCurV Curriculum Framework for Digital Curation in the Cultural Heritage Sector

Laura Molloy
HATII, University of Glasgow

Ann Gow
HATII, University of Glasgow

Leo Konstantelos
University of Melbourne

Abstract

In 2013, the DigCurV collaborative network completed development of a Curriculum Framework for digital curation skills in the European cultural heritage sector.

DigCurV synthesised a variety of established skills and competence models in the digital curation and LIS sectors with expertise from digital curation professionals, in order to develop a new Curriculum Framework. The resulting Framework provides a common language and helps define the skills, knowledge and abilities that are necessary for the development of digital curation training; for benchmarking existing programmes; and for promoting the continuing production, improvement and refinement of digital curation training programmes.

This paper describes the salient points of this work, including how the project team conducted the research necessary to develop the Framework, the structure of the Framework, the processes used to validate the Framework, and three 'lenses' onto the Framework. The paper also provides suggestions as to how the Framework might be used, including a description of potential audiences and purposes.

Received 13 January 2014 | *Accepted* 16 February 2014

Correspondence should be addressed to Laura Molloy, Humanities Advanced Technology and Information Institute (HATII), 11 University Gardens, Glasgow, G12 8QJ. Email: laura.molloy@glasgow.ac.uk

An earlier version of this paper was presented at the 9th International Digital Curation Conference.

The *International Journal of Digital Curation* is an international journal committed to scholarly excellence and dedicated to the advancement of digital curation across a wide range of sectors. The IJDC is published by the University of Edinburgh on behalf of the Digital Curation Centre. ISSN: 1746-8256. URL: <http://www.ijdc.net/>

Copyright rests with the authors. This work is released under a Creative Commons Attribution (UK) Licence, version 2.0. For details please see <http://creativecommons.org/licenses/by/2.0/uk/>



Background

The Digital Curator Vocational Education Europe Project (DigCurV), running from 2011 to 2013, was funded by the European Commission's Leonardo Da Vinci Lifelong Learning programme¹ in order to develop a Curriculum Framework for vocational training in digital curation skills in the European cultural heritage sector.

DigCurV was a collaborative initiative that benefited from the expertise of European training organisations, cultural foundations and academic departments, as well as from related initiatives in the USA and Canada². In this way, the Curriculum Framework emerged from research undertaken by a wide range of cultural heritage institutions of varying sizes, nationalities and types, which shared a particular focus on the training needed to develop new skills that are essential for the long-term management of digital collections.

Central to the foundations of DigCurV was the recognition of the critical need for a multilateral response to the data management expertise, practice and awareness required, so that researchers in the arts and humanities can care for their digital research outputs over time, or at least develop awareness of the skills and knowledge required to do so. This critical need was also identified in museum, library and archive professionals with responsibilities for the long-term stewardship and custodianship of digital objects. By recognizing these issues, DigCurV was faced with a fundamental question pertaining to digital curation education: do those professionally involved in digital curation practice receive the training they need? And what exactly constitutes these training needs?

Another current pedagogical dilemma in digital curation is whether staff in the cultural heritage sector should become more proficient in the curation of digital assets, or whether specific training should be developed to enable a distinct strain of specialism to emerge. The Italian economist Vilfredo Pareto argued at the turn of the twentieth century³ that a society grown wealthy enough would cease to foster general knowledge in individuals and increasingly encourage individual ability in tightly specified and increasingly complex skills. Each worker would become increasingly proficient at one element of the work of a larger project or process. We are currently at a similar point of decision with digital curation training. It is in the context of these debates that DigCurV operated.

Meeting the Demand

The demand for vocational training in digital curation has been signaled repeatedly. In 2004, the Digital Preservation Coalition⁴ and the JISC⁵ established the need for digital preservation skills training in multiple sectors in the UK (Cornwell, 2004).

DigitalPreservationEurope⁶ research also echoed the requirements for these skills to be regularly refreshed by professionals as digital curation practice develops and evolves.

The European Commission has encouraged the growth of digital information professions with the launch of its i2010 strategy in 2005, and the Digital Agenda

1 Information on the programme is available at: <http://www.leonardo.org.uk/>

2 A full list of partners is available at: <http://www.digcur-education.org/eng/About>

3 Described as a 'widely accepted principle' by Rodriguez-Clare (1996).

4 Digital Preservation Coalition: <http://www.dpconline.org/>

5 As it was known at the time; now 'Jisc'.

6 DigitalPreservationEurope: <http://www.digitalpreservationeurope.eu/>

initiative launched in 2010⁷. The subsequent investment in this area challenged the traditional training of LIS professionals in physical curation and conservation by well-established professional and vocational courses. The infiltration of digital technologies into professional activity and the exponential growth in the production of digital objects has instigated an equivalent increase in digital collections held by memory institutions, which LIS professionals are expected to manage and curate. In 2009, the New York Times recognised the growing demand for digital archivist skills in the USA (De Aenlle, 2009).

In 2010, Gartner Research identified four new roles needed by IT departments to remain effective (Gartner, 2010); one of these was ‘digital archivist’ and it was then estimated that fifteen percent of businesses would employ in this role by 2012. And yet, at the 2011 JISC ICE Forum⁸ in the UK, fewer than half a dozen UK institutions were listed as providing digital curation training as part of their professional library and archives courses. This activity is partly undertaken by organisations such as the Digital Preservation Coalition, which runs the popular vocational ‘Getting Started in Digital Preservation’ course⁹. Feedback from this course consistently highlights the need – at least in the UK – from the cultural heritage sector for easy and iterative access to introductory digital curation training for different staff roles.

The existence of such courses supports the view that it is not enough to trust new recruitment into the cultural heritage sector to face the challenges of digital curation. Research conducted by DigCurV shows that – at least in the experience of our respondents – investment is not always channelled towards creating new staff roles to take on the emerging digital curation duties increasingly required by heritage institutions. There is a need for existing staff to adapt to the emerging digital cultural sector.

Further, LIS scholars including Corrall (2012) have noted the need for a competency framework for digital curation. The DigCurV Curriculum Framework works towards these ambitions whilst retaining intelligibility to the LIS field by employing well-established LIS models, such as the Vitae Researcher Development Framework¹⁰ (with its accompanying RIN Information Literacy Lens¹¹), and the SCONUL Seven Pillars of Information Literacy¹². DigCurV was also influenced by the findings of the Digital Preservation Outreach and Education Initiative’s work on classification of audiences for training¹³, which suggests that cultural heritage staff can usefully be grouped into one of three audiences – practitioner, manager or executive – in order to facilitate more appropriate vocational digital curation training.

The use of these models underlines the relevance of the skills of librarians and other information professionals to the emerging digital curation professions, providing at the same time useful examples of competence modelling. The DigCurV Curriculum Framework builds on such accessible and user-oriented approaches to create an initial

7 The European Commission’s Europe’s Information Society webpage is available at:

http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

8 JISC ICE Forum: <http://www.jisc.ac.uk/whatwedo/programmes/preservation/iceforum>

9 See: <http://www.dpconline.org/newsroom/latest-news/1089-back-by-popular-demand-getting-started-in-digital-preservation-london-6th-december>

10 Vitae Researcher Development Framework: <http://www.vitae.ac.uk/researchers/428241/Researcher-Development-Framework.html>

11 RIN Information Literacy Lens: http://www.vitae.ac.uk/CMS/files/upload/Vitae_Information_Literacy_Lens_on_the_RDF_Apr_2012.pdf. Copies of this lens are also available directly from the authors, upon request.

12 SCONUL Seven Pillars of Information Literacy:

<http://www.sconul.ac.uk/sites/default/files/documents/coremodel.pdf>

13 See: <http://www.digitalpreservation.gov/education/educationneeds.html>

attempt at a vocational skills framework for the digital curation professions which, in the DigiCurV context, is understood to comprise museums, libraries, galleries, archives plus relevant departments of higher education institutions.

Aims and Development

DigiCurV aimed to address two types of vocational training: for those aiming to enter the profession (including Master's-level qualifications); and for existing staff (such as in-house skills training or CPD provided by professional associations). Accordingly, the DigiCurV Curriculum Framework is intended to be used by those developing, comparing or reviewing their training offerings, as well as by individual professionals for their own personal development. It was therefore imperative that the Framework reflected a detailed yet flexible approach to curriculum design and evaluation, whilst remaining useable to those with or without specialist knowledge of curriculum development.

In order to achieve this imperative, the Curriculum Framework has been formulated as a matrix of digital curation skills and competences and, where appropriate, pathways of skills progression between one type of professional role and another. This approach derived from a series of large-scale surveys undertaken by the project in 2011, the results of which are summarized in the Survey of Existing Training Opportunities report¹⁴ and the Report and Analysis of the Survey of Training Needs¹⁵. The survey of training opportunities attracted 60 valid responses from 16 countries, while that of training needs analyzed 454 responses from 44 countries. The survey findings were complemented by feedback from nine focus groups across five European countries. The focus groups attracted digital curation practitioners, managers and executives, who participated in a structured discussion about the skills currently necessary in their role and, in the case of managers and executives, in the digital curation roles to which they recruit¹⁶.

Alongside this early activity, the project generated an Evaluation Framework, which is described in the Report on Baseline Survey and Evaluation Framework; Section 2: Evaluation Framework¹⁷. This study contributed to the development of the Framework in a recursive way, in that it both provided the core concepts to build the Curriculum Framework and continues to be of value as a means of gauging and evaluating the suitability of the Curriculum Framework for designing and creating digital curation curricula. These activities and other, smaller research efforts (such as an analysis of relevant European job adverts in the first six months of 2011) allowed the project to amass a body of knowledge on which to base direction-setting.

Development was progressed through extensive testing and evaluation of preliminary framework development: in the first instance, through a series of workshops organised in several locations across Europe; then through a panel of experts in vocational training at a multi-stakeholder workshop. In these ways, the content of the Framework has been elicited from the professions it describes in accord with its ambition to be genuinely useful to professional practice, and so the Framework in its current form provides a robust description of the digital curation professions at the time of publication.

¹⁴ Survey of Existing Training Opportunities: <http://www.digcur-education.org/eng/Resources/D2.1.1-Survey-of-existing-training-opportunities>

¹⁵ Report and Analysis of the Survey of Training Needs: <http://www.digcur-education.org/eng/Resources/Report-and-analysis-on-the-training-needs-survey>

¹⁶ The focus group findings are summarised in the DigiCurV Survey on Training Needs.

¹⁷ Available at: <http://www.digcur-education.org/eng/Resources/D2.1.2-Evaluation-Framework>

At the core of the Framework lies the recognition that digital curation is a complex profession. For successful professional performance, staff must demonstrate domain-specific and technical competences, generic professional and project skills, and personal qualities in a blend appropriate to their particular professional context. We do not, however, expect an individual working within cultural heritage digital curation to possess every skill, ability or piece of knowledge enumerated within the Framework. Rather, the Framework is an aspirational model, providing a range of competences and qualities to which individual professionals can aspire in their pursuit of professional excellence.

Structure and Presentation

The full Framework can be consulted on the DigCurV website¹⁸. It comprises three interrelated parts:

- A core Curriculum Framework model, which provides in a cogent, relevant and approachable manner the constituents and interactions of different layers involved in digital curation training;
- Three ‘lenses’, or views, one each for three broad types of professional role: Practitioner, Manager and Executive;
- A technical specification that outlines the groundwork for the Framework, defines the Framework’s terminology and identifies the interactions between the Framework and lenses (Molloy et al., 2013).

To address the full scope of digital curation activities, and to provide the necessary flexibility for relevance across diverse professional and institutional contexts, the DigCurV Curriculum Framework encompasses a wide range of skills. These skills are expressed as descriptors and arranged into a hierarchy of quadrants and subcategories so that users may either examine the full scope of digital curation activities, or drill down into the skills associated with specific areas of interest.

To aid navigation across this range of skills, each individual descriptor in the DigCurV Curriculum Framework is assigned a unique alphanumeric identifier. However, these are not reproduced in individual lenses. The lenses are intended to be a representation of the content of the framework at the highest possible level meaningful for a particular audience; the skill identifier code would add visual clutter and would not add to meaning in this context. The identifiers do, however, enhance usability in the overall framework by providing an additional means of identifying specific descriptors in the larger overall set of information.

Definitions

In order to provide clarity and supplement understanding of the development process, a short list of definitions of terminology is provided here alongside a concept model (Figure 1). Whilst the list of definitions may be useful to all users of the Curriculum Framework, the concept model and map are reproduced here to aid understanding of the development process and the relationship between concepts involved in the Framework development and need only be referred to by users where this is of interest.

¹⁸ DigCurV: <http://www.digcur-education.org/eng/Resources/D4.1-Initial-curriculum-for-digital-curators>

- **Competence:** The ability to do what is required (Grant, 2010).
- **Designated community:** An identified group of potential consumers who should be able to understand a particular set of information. The designated community of each institution may be composed of multiple user communities.
- **Domain:** The specific professional context of a cultural heritage institution or a subject area within arts and humanities disciplines.
- **Domain expertise:** Knowledge, experience and competence that have been acquired through a consistent track record of successful projects accomplished in various domain areas.
- **Knowledge:** The body of facts, principles, theories and practices that is related to a field of work or study. This is identified in the Curriculum Framework as ‘understanding’.
- **Longitudinal evaluation:** Reiterative review over time, resulting in ongoing improvement.
- **Skills:** Cognitive competences (involving the use of logical, intuitive and creative thinking) or practical competences (involving manual dexterity and the use of methods, materials, tools and instruments. These are identified in the Curriculum Framework as ‘abilities’.

Concept Model

In order to facilitate the understanding of the framework and the relationships between layers, a generic high-level concept model has been developed (Figure 1).

Each layer of the model is described in more detail below. For definitions and disambiguation of terminology, please refer to ‘Definitions’ above.

At the heart of the Curriculum Framework is a common set of descriptors, from which can be selected those specific to three distinct roles represented by the Curriculum Framework lenses: Practitioner, Manager and Executive. In this instance, these roles are viewed as comprising the cultural heritage domain identified within the remit of DigCurV, as discussed above. A domain can be an institution (e.g. the British Library) or a subject area within the Arts, Humanities or Information Sciences relevant to the cultural heritage sector. In this sense, the domain layer encapsulates an instantiation of a curriculum within the context of the specific domain.

The areas of convergence between the lenses form common grounds. Further work could usefully define a set of core knowledge and skill elements that should be shared across all three lenses. The areas of convergence are described and connected on the page of the DigCurV website entitled ‘Comparing Skill Requirements across Executives, Managers, and Practitioners’¹⁹.

The Curriculum Framework layer

This layer represents the Curriculum Framework as presented in its current form in this document and any future iterations.

¹⁹ See: <http://www.digcurv.gla.ac.uk/lensComparison.html>

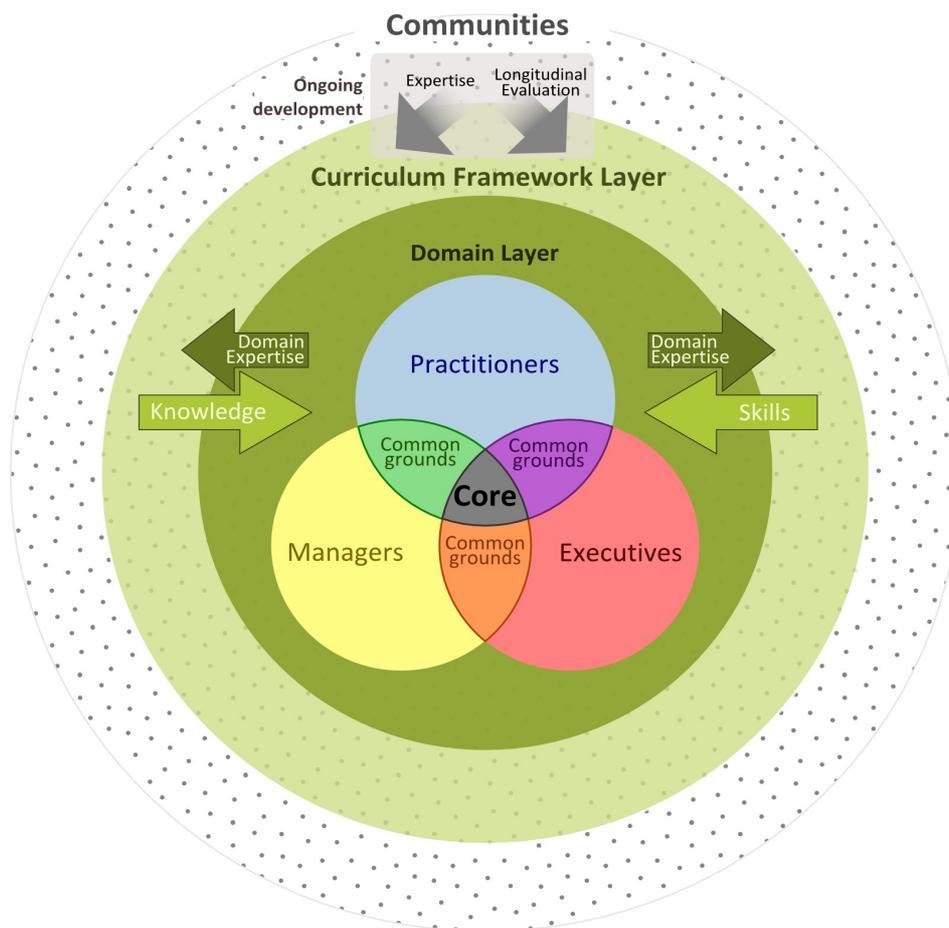


Figure 1. DigCurV concept model of the DigCurV Curriculum Framework.

Interactions between Domain and Curriculum Framework layers

Each lens should portray its ability to participate in digital curation curriculum activities through knowledge and skills components. These components form the core of the Curriculum Framework and feed into the generation of a domain curriculum.

In parallel, the roles within the domain lenses possess knowledge, experience and competences that have been acquired through continuing and consistent accomplishments within a domain. This domain expertise informs the Curriculum Framework, providing input regarding the necessary knowledge and skills that a digital curation curriculum should include to be relevant to contemporary professional practice. This generates a corpus of knowledge within the Framework. Through the Framework's use, this knowledge is fed back into the domain through the curricula that are created.

Communities

Communities represent the extrapolation of the Curriculum Framework from the organisational/institutional layer (domain) to the collective/social layer. A digital curation curriculum required for the purposes of one organisation/institution in a domain becomes part of a wider network that comprises curricula from a range of organisations and domains. In addition to eliciting Framework content from communities, the collective memory and derivation of expertise from multiple or different uses of the Framework informs the ongoing development of the Framework. In the long term, the Curriculum Framework may combine a variety of sub-frameworks (hence pluralised) each satisfying the requirements of specific domains and/or uses.

Interactions between Curriculum Framework layer and Communities

By definition, the Curriculum Framework cannot be static, neither as a concept nor as a tool. Digital curation is a dynamic field, its methods and techniques changing as we gather more knowledge and experience. We therefore postulate that the framework requires ongoing development in order to be creditable, usable and always relevant. This ongoing development is a result of a variety of methods, including – but not limited to – longitudinal evaluation and appraisal and exposure to community expertise.

Three Views or Lenses

The full Curriculum Framework is freely available on the DigCurV website alongside a number of supporting resources. Amongst these are three views or ‘lenses’ onto the overall Curriculum Framework, each specified in a downloadable colour document to facilitate on- or off-line use²⁰. These have been particularly developed in order to stimulate use by individuals for their personal and professional development planning.

The three lenses were developed in response to the findings of the DPOE initiative’s work on classification of audiences for training, as mentioned above. DPOE found that if cultural heritage institution staff with digital curation responsibilities are divided, based on their role, into one of three broad staff groups – practitioner, manager or executive – then training methods that are more appropriate for each group can be applied.

The lenses provide fine-grained information on the specific sets of key knowledge, skills and competences that are necessary for each of the target audiences to engage in successful digital curation practice. This provides a more closely-tailored model for the user to employ when attempting to establish, conduct and/or assess successful digital curation curricula in their own particular context. Each lens binds together elements from the previous work with the results of research conducted by DigCurV survey work and the influences of the other relevant models listed above.

The lenses consider how practical, managerial and executive roles in digital curation map to each descriptor. These skills and competences encompass not just technical knowledge and duties but – in accordance with the overall framework – also encompass personal attributes and behaviours, further helping to define the approaches that a curriculum should encourage in individuals to shape them for success in digital curation professions. To ensure ease of use and to minimise barriers to comprehension, the language was attuned in response to feedback from the community, and skills and competences throughout were categorised into things that the individual ‘understands’, ‘is able to’ do and ‘is aware of’.

In this way, each lens aims to specify the knowledge, abilities and awareness that should be addressed by digital curation training for a specified level of staff in a cultural heritage institution.

Executive lens

The skills defined under the Executive lens are the skills that will enable a digital curation professional to maintain a strategic view of digital curation, to understand the emerging challenges in digital curation for the cultural heritage sector, to make informed decisions to meet these challenges, and to allocate resources strategically.

²⁰ Available at: <http://www.digcurv.gla.ac.uk/executiveLens.html>, <http://www.digcurv.gla.ac.uk/managerLens.html> and <http://www.digcurv.gla.ac.uk/practitionerLens.html> respectively.

Manager lens

The skills defined under the Manager lens are the skills that will enable a digital curation professional to plan, position and monitor the execution of digital curation projects and programmes of activity, to recruit and support project teams, and to liaise with a range of internal and external contacts within the cultural heritage sector. The manager may have previously worked at practitioner level, but equally it is possible they may have entered the organisation at manager level without direct practitioner experience.

Practitioner lens

The skills defined under the Practitioner lens are those that will enable a digital curation professional to plan and execute a variety of technical tasks necessary to digital curation work, both individually and as part of a multi-disciplinary team. This includes understanding diverse issues relating to both digital curation in general, and to a specific area of cultural heritage.

Users should always refer to the online resources²¹ created by the project for the latest stable version of the lenses.

Current Use and Future Directions

Within the remit of the DigCurV project, three distinct uses of the Curriculum Framework were postulated as templates for immediate application in areas pertaining to digital curation vocational education: (1) to build or develop training; (2) to compare existing courses; and (3) to plan for professional development.

Training Development

The Framework can be used to inform the development of new training courses. Depending on the user's aims, the Framework can assist in providing a structure for a generic training programme targeted at digital curators, or it can provide an indication of the subjects that could usefully be covered in shorter, more specialised courses addressing one particular area of professional digital curation practice. The common language used in the Framework may allow those building and developing training to communicate more effectively the value of their training offerings.

Comparing Existing Courses

The Framework provides a benchmark to support the comparison of existing training and also a way to map various training offerings against each other. The professional who is considering undertaking training may wish to compare available training programmes to help identify those most appropriate for their needs. The Framework can be used by training providers, both internal and external, to compare existing courses and to assess their suitability for their own institution's requirements.

²¹ Available at: <http://www.digcur-education.org/eng/Resources>

Planning for Professional Development

The Framework identifies a broad range of skills and knowledge needed by professionals at various levels to deliver successful digital curation in the cultural heritage sector. Individuals either intending to enter or already working in digital curation in the cultural heritage sector may find it useful to map their own strengths against the Framework, as well as to use the Framework to identify and describe areas in which they would find further training appropriate, if not essential.

Current Use Cases

Various institutions in the higher education sector have found the Framework useful to date. Amongst them, University of London Computer Centre (ULCC), providers of the vocational Digital Preservation Training Programme (DPTP), mapped their curriculum to the Framework, helping to review and reflect on programme content and delivery style. The Department of Information Studies at University College London found the Framework helpful as a tool for skills auditing with those Master's students who had undertaken an option in Digital Curation. The Framework has also been useful to the University of Aberystwyth in devising its MSc Digital Curation programme. The Professor of Library Science at Purdue University Libraries reported that the Framework has been helpful in understanding the impact of various aspects of the curriculum and the importance of understanding the needs of various professional audiences²².

Future Directions

In developing a detailed and flexible Curriculum Framework for digital curation vocational education, the DigCurV project team anticipates that relevant communities of theory and practice will devise new and innovative applications of the Framework. Further work could usefully define a set of core knowledge and skill elements that should be shared across all three lenses. In addition, the overall Framework and its lenses would benefit from translation into additional languages. The Framework could also extend its impact by becoming interoperable in a meaningful way with the DigCurV registry of training opportunities²³. There is also scope to develop relationships with training organisations to foster use of the Framework, as well as to continue observing use by higher education institutions; this would benefit from accreditation of the Framework by standards and professional bodies referenced within the resource.

Acknowledgements

This paper draws on various DigCurV project deliverables. The contributions of members of the network to these deliverables are gratefully acknowledged.

²² The three latter reactions are available in full in Molloy et al. (2013).

²³ DigCurV registry or training opportunities: <http://www.digcur-education.org/eng/Training-opportunities>

References

- Cornwell Management Consultants PLC. (2004). *DPC training needs analysis final report: A study funded by the Joint Information Systems Committee*. Retrieved from <http://www.jisc.ac.uk/media/documents/programmes/preservation/trainingneedsfinalreport.pdf>
- Corrall, S. (2012). *A Competency Framework for digital curation and data science*. Paper presented at the Aligning Digital Preservation Across Nations workshop, Amsterdam, Netherlands. Retrieved from http://digitalcurationexchange.org/system/files/corrall-competency-framework_0.pdf
- De Aenlle, C. (2009, February 8). Digital archivists: Now in demand. *New York Times*. Retrieved from <http://www.nytimes.com/2009/02/08/jobs/08starts.html>
- Gartner, Inc. (2010). *Gartner identifies four information management roles IT departments need to remain effective*. Retrieved from <http://www.gartner.com/it/page.jsp?id=1282513>
- Grant, S. (2010, November 24). The basis of competence ideas [Web log post]. Retrieved from <http://blogs.cetis.ac.uk/asimong/2010/11/24/the-basis-of-competence-ideas/>
- Harvey, R. (2007). *Professional development in digital preservation: A life-long requirement*. Digital Preservation Europe.
- Molloy, L. et al. (2013). *Toward an initial curriculum for digital curators* (Project Deliverable 4.1). Retrieved from DigCurV website: http://www.digcur-education.org/eng/content/download/10836/166027/file/D4-1_Curriculum.pdf
- Rodriguez-Clare, A. (1996). The division of labor and economic development. *Journal of Development Economics*, 49, 3–32. doi:10.1016/0304-3878(95)00051-8