Object-based learning and research-based education

Object-based Learning and Research-based Education: case studies from the UCL curricula

Thomas Kador, Leonie Hannan, Julianne Nyhan, Melissa Terras, Helen J. Chatterjee and Marc Carnall and Ulrich Tiedau

Abstract

This chapter explores the strong relationship that exists between object-based learning and research-based education. Object-based learning as applied here prioritises interaction with museum objects to enhance critical thinking and key skills in university learners. Research-based education is focused on the students themselves engaging in the process and practice of primary research, rather than teachers imparting their research through their teaching. Our three case studies taken from current teaching at University College London (UCL) demonstrate how object-based learning using museum objects can be used effectively within research-based curricula. In this context this article responds to UCL's Connected Curriculum initiative which will see a gear-change in teaching and learning at the University – one that prioritises holistic degree programmes with research practice and teacher-student collaboration at their core.

Introduction

In this chapter we present a number of case studies that illustrate how cultural resources, such as museum objects can be utilised to design a research-based education through the use of object-based learning activities/approaches. As an educational institution UCL is very fortunate to have ready access to a substantial amount of specimens and artefacts from 18 large teaching collections. This includes three public museums – the UCL Art Museum, Petrie Museum of Egyptian Archaeology and the Grant Museum of Zoology – as well as 15 further departmental and subject specific collections of objects; ranging from Anatomy to Space exploration and totalling well over 400,000 objects. Students and

teachers at UCL are particularly privileged to have access to such a vast array of museum objects. However, most other universities – even if they don't have a university museum of their own – are located in proximity to museums or galleries with which they could forge collaborative partnerships. Such partnerships would provide their students with access to museum objects for object-based educational programmes similar to the ones discussed here.

Before presenting these case studies we will begin by briefly outlining what object-based approaches to learning entail and what the pedagogical benefits for a research-based education using museum objects are. Put simply, object based learning is a pedagogy that prioritises interaction with material culture to enhance critical thinking and key skills. Material culture in turn is a very broad term that includes everyday objects, documents, works of art, biological specimens and artefacts, to name but a few (Buchli ed. 2002). However, in the context of this discussion we are particularly interested in exploring the merits of utilising objects and specimens from museums' collections in University teaching.

What do collections of museum objects bring to research-based education in Higher Education?

There is a longstanding historical relationship between (higher) education and object handling. Collecting, touching and engaging with physical objects – very often works of art or historical artefacts – used to be the mainstay of many academic disciplines. This has led to the creation of teaching collections which in turn, as they became larger, gave rise to the emergence of university museums (ref). Britain's, and probably one of the world's, oldest university museum is the Ashmolean Museum in Oxford which goes back to a gift of the collection of Elias Ashmole in 1683. The museums at UCL date back to 1827 with Robert Edmond Grant's teaching collection of zoological specimens and 1847 with the donation of a large collection of John Flaxman's sculptures (Chambers 2008). Similarly universities in

numerous other European cities established museums between the 17th and 19th centuries and while there are still many such university museums left across Europe the use of their collections in day to day teaching appears to have declined steadily throughout the (second half of) the 20th century (ref). But in recent decades, and in the light of mounting evidence for the benefits of object-based learning, this trend is beginning to being reversed and we can observe a resurgence in the integration of university museums and their collections into mainstream teaching (e.g. Chatterjee 2008; Chatterjee et al 2015; Alvord and Friedlaender 2015; Bartlett 2015).

Objects can be viewed from many different perspectives to reveal multiple, and sometimes contested, meanings. While engagement may start with object-focused questions such as: What is it? What is it made of? How was it made? Where is it from? When was it made? How was it used? Answers to these questions open up further research areas about how objects connect people and places, hold multiple meanings and express knowledge and cultural values. In this way objects and collections lend themselves extremely well to active learning (Bonwell and Eison 1991), as object focused tasks allow learners to engage with the object, its history, contexts, relationships and even its social life, on an ever more complex level. But the students can discover these new avenues of investigation for themselves, as they respond to the prompts the objects raises for them personally, and are thus much more likely to recall their discoveries subsequently and make their own meaning with them.

Learning with objects operates also well within Gardner's theory of multiple intelligences (Gardener 1993). As object engagements operate not only on a verbal and visual level but also allow learners stronger in kinaesthetic or bodily intelligence to do well, especially through the medium of touch and the foregrounding of haptic qualities of objects (Chatterjee 2008). The case studies presented in this chapter, taken from within the UCL curriculum, provide some good illustrations of this. For example in 'Object Lessons' (see below) students are tasked to engage closely with one specific museum object – taken from

one of UCL's collections – for the duration of an entire term. Facilitated by an accompanying programme of lectures and seminars, this offers the students the opportunity to approach the object and make sense of it for themselves from multiple perspectives and chose to apply whatever approach works best both for them personally, and the particular object they have been given.

But in line with another aspect of Gardner's theory, object-based learning also appeals extremely well to social learning and is therefore well suited for students with particular strengths in interpersonal intelligence. Staying with Object Lessons, the second part of this module focuses on a team exercise in which the students, in small groups, have to bring together their individual objects in order to find a common denominator that will provide the theme for a virtual exhibition that they have to design. To do this they have to sharpen not only their observational and investigative skills for engaging with the objects but also their interpersonal, communication, decision making, delegation and team working abilities.

Museum objects are – perhaps with the exception of extra-terrestrial rocks, which we hold in our geology collection – by definition of the real world. Therefore, directly engaging with these 'real-world' objects allows students to relate theoretical concepts to something practical and tangible. Objects demand learners to master these 'threshold concepts' before they can move on and engage with a topic on a higher level (Meyer and Land 2003; 2005). But as the students are so focused on the object(s) and the task in hand, mastery of such often difficult concepts can frequently happen almost unnoticed. So while students work on achieving an understanding of an object, the learning of the concepts associated with this task doesn't seem arduous at all and can appear to take place relatively effortlessly, which is, as we would contend, the way learning should happen.

In addition to the ever growing body of literature highlighting the educational benefits of learning through objects (contributions in Chatterjee and Hannan 2015), on a wider, more holistic level there is also an increasing amount of evidence for the broader health and

wellbeing benefits of people engaging with objects; especially through touch (Chatterjee and Noble 2013). Therefore, learning with objects will not only help the students in grasping difficult concepts but could also bring further positive effects through a simply more enjoyable learning experience.

But the first step in designing object-based learning activities is to identify the right objects for the task and this means generally collaborating with a museum or the curator of a teaching collection. As already discussed, students and teachers at UCL are in an extremely fortunate position in this regard and it is very straightforward for UCL academics interested in utilising object-based learning in their practice to get started. What is more, the department responsible for the museums and collections at UCL, PACE (Public and Cultural Engagement), has a team of curatorial, conservational, education and public engagement specialists specifically there to enhance the learning opportunities that these collections present. Therefore, the key mission at PACE is not only to use the collections to drive our own teaching and research programmes, but to facilitate our colleagues from across UCL (and beyond) to work with these collections in developing innovative teaching and learning programmes appropriate to their own students and academic disciplines. This is well illustrated by the case studies presented here from the Digital Humanities and the BASc Arts and Science degree programme. They demonstrate how museum objects can be used to facilitate both disciplinary and interdisciplinary learning and crucially, most of this learning takes place through student-led investigation in response to the objects. This is precisely the learning achievement associated with our first case study.

Case Study 1:

Designing and Teaching an Object-Centred, Interdisciplinary Module

'Object Lessons: communicating knowledge through collections' is a module on the BASc Arts and Sciences undergraduate degree programme at UCL. This programme was launched in 2012 and offers students in UK higher education a new experience – the opportunity to study both arts and sciences within one undergraduate degree programme. Whilst the degree is naturally very broad-based, students are able to tailor their studies by choosing a major pathway: cultures, health and the environment, sciences and engineering or societies. These pathways allow learners to navigate the fantastically broad range of modules available to them (anything from English literature to civil engineering). A series of degree-specific core modules also run through the programme and have been designed to develop students' knowledge and skills in an explicitly interdisciplinary way. Object Lessons is one of these core modules and is taken in the second term of the second year of the degree programme. Here, we will discuss the way the module was designed with research-based education in mind and will reflect on how teaching the module has shed light on the opportunities and challenges of making our curriculum 'connected'.

Object Lessons is structured around weekly lectures and seminars. The lectures, which form the back-bone of the module, are given by a range of speakers and introduce the students to different disciplinary perspectives on studying material things. For example, a lecture on Materials and Materiality by Professor of Archaeological Sciences Marcos Martinón-Torres is followed by one on The Social Life of Things by design anthropologist Dr Adam Drazin. In this way, the lectures move through key conceptual, theoretical and research practice issues as they are encountered in materials science, archaeology, anthropology and historical material culture studies. In the second half of the module, lectures are delivered by curators and museum professionals in order to help students think about objects not only as embodiments of ideas but also as tools for communicating those

ideas. The content of the lecture series was chosen to provide students, week-by-week, with the tools they need to complete their assessed work. So, the first series of disciplinary approaches to the study of material culture accompanies the students through their own object-based research and report writing, whilst the second half of the lecture series underpins their group work on an exhibition project. Weekly seminars provide a space to discuss the content of the lectures further and to test things out in practice. The seminars are active, enquiry-based learning sessions conducted in small groups (with a facilitator per group of six students). These classes use museum objects to help students improve their analytical skills and to prepare for their assessments.

The module has two main assessments: an object report (conducted individually) and a group virtual exhibition project. At the start of the module, each student is allocated a different UCL museum or library object to research. This could be a zoological specimen, an ethnographic or archaeological artefact, an object relating to the history of science, a rare book, a manuscript or an art work. The students are asked to conduct independent research into their object and to make use of more than one disciplinary framework for the study of material culture in this process. Students arrange visits to the museum collection and are able to delve into existing museum records as primary research material. The students might also draw on the knowledge of the given curator and are expected to conduct wider secondary reading to contextualise their object and develop an argument for the resulting report. The object report is 2,000 words in length and carries 40 percent of the total mark for the module. The intention with this assessment was to offer students a genuine, individual research project – in some cases a real mystery as many museum objects have had very little research conducted on them to date and are in need of better documentation. As each student is given a different object, they need to consider how to respond to the particularities of their given object and make decisions about how they can use evidence to make an argument in their reports. In this way, students are asked to make decisions about how to use evidence, methods of analysis, methodology and argument to the best effect. This is a

challenging exercise, but the module provides lots of opportunities for one-to-one support as students develop the shape of their research and plan their report writing. There is also an emphasis on students bringing their own cross-disciplinary knowledge to this project, alongside the perspectives offered in lectures, in order to achieve an interdisciplinary response to the object. Student feedback in module evaluation reflected this ethos:

> There was a lot of flexibility in terms of how to 'interpret' the object report, which at first seemed very daunting. In the end, it ended up being a good learning process, having to figure out yourself how to best structure the assignment according to your object. (Object Lessons, Spring 2015)

In the second half of term, the students work in groups of six and devise a virtual exhibition featuring the six objects that formed the basis of their object reports. The first step is to develop a theme that can connect the objects and discuss how to communicate this theme through the exhibition. Students need to decide on a target audience for the exhibition and tailor the content to this audience. Whilst they draw on the content of their object reports in constructing the exhibition, it is important that they make sure the exhibition achieves an appropriate tone and consistent mode of presentation throughout. The lectures during this second half of the module are focused very much on issues of communication, audience, design and digital interactivity. The group project itself is worth 40 percent of the total module mark and the students give an oral presentation on the process of putting together the exhibition, for which they are awarded a further and final 20 percent of their marks. Through this process of interrogation, research, documentation and presentation, a range of research and practical skills are developed. Students develop an awareness of the strengths and weaknesses of different sources of information, for example, the textual, material, visual and auditory, and learn how to combine these sources in the analysis of a particular theme or research focus. As one student commented:

It was enlightening to learn about objects through actually interacting with them. It really helps to get knee-deep into the subject matter and not make it just one more example in the textbook. (Object Lessons student, Spring 2015)

From the outset, Object Lessons, draws students in to the practice of primary research by asking them to conduct an entirely novel research project and providing them with the support they need to access relevant resources and expertise. Students are initially given access to the object they are to research but must, thereafter, make arrangements with curators and librarians to conduct follow-up research visits, thus developing independent research skills. As one student described:

I enjoyed it. It felt far more independent and investigative than other forms of research. (Object Lessons student, Spring 2015)

Student research of a good quality is added to existing documentation on museum objects and forms a part of the research resources made available for future researchers using these collections. Throughout Object Lessons, students are explicitly asked to make connections across subjects and this is an important assessment criterion for their object report. As a student commented in 2015:

[Object Lessons is] mind-opening; it is a good introduction to museum curation and it brings us new perspectives to view things around us. I like this very much as we can really touch and learn a real thing and connect them with the culture context. (Object Lessons student, Spring 2015)

The virtual exhibition project asks students to develop content aimed at a specified public audience and – in collaboration with colleagues in E-Learning Environments – the Object Lessons teaching team have put in place a system whereby students can choose to publish or open their virtual exhibition and have continued access to it for future uses. This has converted an assessment that was outward looking but, in reality, closed into an assessment that can become part of each students' personal portfolio and a product that can be publicly accessible and invite dialogue with audiences outside of UCL. There is more work to be done on stream-lining the logistics of making a piece of formal assessment into a usable public-facing product of ongoing use to the students. It is hoped that by exploring this subject in terms of this BASc module, lessons can be learned that will be of use to other programmes across the University.

Object Lessons also aims to connect learners with world-leading research via the lecture series, which introduces them to a range of UCL academics working at the cutting edge of their field. Through these lectures, students are introduced to different theoretical and disciplinary frameworks for thinking about material culture. Through research visits to collections, students are supported in their research by curators and librarians who have expertise in the histories and meanings of historical collections. Through conducting research on collections and working directly with curators and librarians on the project work, students are introduced to the detail of professional life in Museums and Libraries. They are asked to consider the opportunities and constraints offered by the Museum or Library as a custodian of collections when they build their own exhibitions in a virtual environment. In this way, Object Lessons connects students not only with academic research, but also with practice-led research and workplace learning in the museums and libraries sectors.

Lastly, Object Lessons ensures that students connect with each other during their course of study. Every weekly seminar is conducted in small groups and is based around active, object-based or enquiry-led learning activities. The group project also encourages students to engage with each other's strengths and academic perspectives in order to create

the best possible virtual exhibition. This aspect of collaboration and team-working is represented in the assessment criteria and is, therefore, an explicit aim of the project. Collaboration and teamwork are also essential elements of the next case study, focused on the use of one specific UCL collection, namely that associated with Sir Francis Galton.

Case Study 2: Object-based learning with the Galton collection

Digital Resources in the Humanities (hereafter DRH) is a core module of UCL's MA/MSc in Digital Humanities programme. The MA/MSc in Digital Humanities in the Department of Information Studies, UCL, was launched in 2010 (UCL Centre for Digital Humanities 2015). It is an interdisciplinary programme that investigates the past, present and future roles of digital technologies in the research and teaching of the Humanities and Cultural Heritage. The module DRH provides students with a wide-ranging introduction to established and emerging areas of Digital Humanities, especially the use of computational technologies to explore, interpret and reimagine the 'cultural complex' (Standing Committee for the Humanities 2007) of the Humanities

Elsewhere some of us (Nyhan 2015; Nyhan, Terras et al 2014) have outlined how object-based learning has become a pedagogical pillar of this course, for various reasons. At the broadest level, it is useful because it can help students to learn in an 'integrative' way. Integrative learning seeks to help students to notice the connections between the otherwise seemingly disparate subjects, concepts and debates that they study in their various modules. The outcome of such learning should be the ability to independently and creatively apply their knowledge to the novel situations that they encounter within and without the class room, now or in the future (see, for example, Huber and Hutchings, 2005) Indeed, such learning is *sine qua non* of Digital Humanities because it is not only interdisciplinary but also 'extramural' in the sense that successful students can expect to find employment in a wide

range of contexts and industries. We will now briefly introduce the history of UCL's Galton collection and describe how it is integrated into DRH as an object-based learning exercise.

As mentioned above, in addition to its three public museums UCL is home to a number of other collections that are accessible upon request but not on permanent display. The Galton collection falls into this category. Sir Francis Galton (1822-1911) was born in Birmingham and went on to read mathematics at Cambridge. From today's vantage point Galton is a perplexing and discomfiting character who eludes categorisation. He was an important and productive scientist who made many important contributions such as the science of finger printing, weather maps and advancements to statistical analysis more generally. However, he was also a racist who coined the term 'eugenics' "to describe the science and idea of breeding human 'stock' to give 'the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable'" (The Galton Collection 2015).

Though he was not directly employed by UCL he worked closely with some of its Professors, such as Karl Pearson and Flinders Petrie. In 1904 the university also provided him with rooms at 50 Gower Street for the 'Eugenics Records Office'. Upon his death, in 1911, he bequeathed £45,000 to UCL for the establishment of the Chair of Eugenics along with a number of objects that form the basis of what is now known as the Galton collection. It comprises his personal effects, objects that he brought back from his travels, and various objects relating to the research he did on areas such as Criminology. The most challenging and upsetting objects in the collection for many are those that related to his 'Anthropometrics' research, 'the measurement of human features which Galton considered indicators of human ability and behaviour'. For example, die 'Haarfarbentafel', is a collection of 30 samples of dyed hair, numbered from 1-30. Reeves has written of it:

The hair scale is scientific. It is a 'standard' scale which means that all race scientists invest in its truth. The dark-haired races cannot escape the truth. At Auschwitz-Birkenau,

Bergen-Belsen, Dachau, Treblinka, Hadamar, hair shaved from those who perish rarely

matches samples 12 to 24. Most are piles of clipped raven's wings (Reeves 2013, 61).

The catalogue to the Galton collection is online and freely accessible; however, it is

very difficult to use without prior knowledge of the scope of the collection. Each year

students are asked to explore the catalogue in advance of the object-based learning

session, which is usually led by the collection's curator Subhadra Das. The class discussion

(and inevitable debate) that follows the viewing of the collection offers students a unique

opportunity to apply the knowledge they have already gained on the course to a completely

new set of objects and, most importantly, to problematize that knowledge.

Once we have viewed the collection the students are asked to describe the kind of

digital collection they would make for it should money and resources be no object. We

discuss the various approaches and techniques covered earlier in the class that would allow

the collection to be published online and searched with more ease; for example, 3D

digitisation and faceted browsing. However, the wider social and cultural complexities of

digitally remediating such a collection invariably emerge during this discussion. In earlier

sessions of the course we will have talked about digitisation as an unqualified good and a

force for the democratisation of access to knowledge and objects. The objects in the Galton

collection may not negate this statement but they certainly cast it in a new light. Up to this

point the various themes of the course will have been taught on a weekly, and somewhat

disjointed basis. However, this class emphasises that a rich understanding of Digital

Humanities approaches to cultural heritage require not only knowledge of technological

issues but also, for example, the necessity of devising sensitive and ethical approaches to

making digital collections of (in this case) racist objects universally available. So too, the

object-based learning session affords opportunities to reflect on more far-reaching issues,

such as the ubiquity of narratives of techno-triumphalism and the role of Digital Humanities

in disrupting them. In this way the object-based learning session on the Galton collection

prompts students not only to integrate and apply the wide range of knowledge and skills that

they will have learned during the module (and the course as a whole) to a novel situation but to also consider the future of Digital Humanities and the contribution that they each can make to it.

Our final case study – also drawn from the Digital Humanities – will continue with this possibility of students, through their research and inquires, making an actual and valuable contribution to the wider teaching and research community of UCL and beyond

Case Study 3: Digital Humanities as practical exploration: Teaching Digitisation with The Slade Archive Project

The Slade School of Fine Art, an internationally leading art school based at University College London which since 1871 has trained generations of world renown artists[1], has an intriguing but underused archive relating to students and staff, and their teaching, artworks, and experiences. This extensive archive provides rich evidence of the college culture and includes papers, photographs, class lists, student records, audio recordings, films, prospectuses, death masks, and other artefacts. However, this archive is difficult to access, no attempt has been made to present it to a wider audience, its cataloguing is incomplete, and any documentation systems are not interoperable (Bruchet *et al* 2014, Terras *et al* 2015).

The Slade Archive Project (Slade School of Fine Art 2015), jointly undertaken by the Slade and UCL Centre for Digital Humanities from 2012, is a highly iterative, exploratory collaboration, investigating how digital tools and techniques can increase engagement with the archive. Our project informs and enhances the use and understanding of digital methods available to Art Historians – a field which has not, to date, made much use of computational research methods (Rodriguez 2012, Rodriguez 2013, Long and Schonfeld 2014, Dobrzynski 2014) – and encourages and supports new archival approaches (Bruchet *et al* 2014, Terras

et al 2015). In addition, using the Slade Archive in our teaching practices within the Digital Humanities MA/MSc in a Library and Information Studies school allows students to engage with contemporaneous debates on best practice in archival digitisation, contributing both to the digital element of the Slade Archive Project, whilst developing student's practical and professional skills.

The project was conceived as a flexible and collaborative frame under which various sub-projects could be developed, driven by the specific interests of those working at the Slade, and by available resources. Framing the project as a Digital Humanities one opened up access to resources maintained by UCL Centre for Digital Humanities such as the multi-modal digitisation suite and allowed us to embed activities in teaching delivered as part of the MA/MSc in Digital Humanities course "Introduction to Digitisation". Students have to work in groups, with a small, defined set of material from the Slade Archive, to undertake a complete digitisation project from "nail to nail"[2]: taking historical photographic material from the archive, digitising and creating digital image surrogates, providing full metadata, and delivering the resulting files in such a way that they can be ingested into UCL Library's digital catalogue and Slade Archive site, so others can then access the material, with the archival material being delivered back to the Slade. The teams of students have to establish hierarchies and workflows in this time limited task which gives them an understanding of commercial digitisation practices within the cultural and heritage sector which would only be possibly through undertaking such a practical task, and are also required to produce a self-reflective essay on what they have learned about digitisation, and themselves, by undertaking this activity.

In undertaking the student projects in this way we are, as curator Matthew Tietelbaum (1996, 40) wrote, "learning in public". The range of activities have expanded beyond the familiar art historical activities of researching in and extracting from the archive, to encompass the collaborative, digitally-iterative and publicly-situated work of "enabling, making public, educating, analysing, criticizing, theorizing, editing, and staging" (Weski et al

2012, 8). Embedding the archive in teaching provides the means to approach, refine, and choose ways in which to interrogate and understand the nature of the archive, whilst challenging conventional epistemological and disciplinary frames as it brings methods, practices and theories together in new configurations (Cook 1997). The teaching element of the Slade Archive Project allows us to conceptually rethink the remit and scope of such archival projects, and the role that Digital Humanities courses have in fostering and exploring new teaching techniques utilising archival materials. New convergences of collections, teaching, and the digitised spaces between, continue to form new opportunities in pedagogy.

Conclusions

In a connected curriculum the threshold between expert researchers and novice students is lowered significantly. Learners – in this case university students – are directly integrated collaboratively into the research process and become thus empowered to construct their own meanings. There are many ways to move current teaching practice in Higher Education in this direction. We hope that our chapter has highlighted how object-based approaches to learning – using collections of museum objects – provide excellent opportunities for students becoming researchers whether by engaging closely with only one object or dealing with an entire collection. Heritage is always dissonant (Tunbridge and Ashworth 1996) and therefore there are never simple, singular ways to understanding or engaging with museum objects. Being given the opportunity to work with real objects and to appreciate their often troublesome and conflicted meanings – as for example those from the Galton collection – students will acquire not only subject specific skills but will also get to analyse and question the epistemological frameworks within which knowledge is and has been constructed. Finally, with assessments specifically geared to real-world problems, students also get to contribute to the creation of understandings and the production of resources that will be useful beyond the context of their own course of study.

References

Bonwell, Charles C.; Eison, James A. (1991) *Active Learning: Creating Excitement in the Classroom*. Washington DC: ASHE-ERIC Higher Education Reports.

Bruchet, L., Malik, A., Collins, S., Beavan, D., Giacometti, A., Volley, J., and Terras, M. (2014). 'The digital curatorial landscape of the Slade Archive Project'. *Archives 2.0 Conference, Saving the Past, Anticipating the Future*, November 2014, University of Leeds.

Buchli, V. (2002) *The Material Culture Reader*. Oxford, Berg.

Chatterjee, H.J. (ed.) (2008) Touch in Museums: Policy and Practice in Object Handling. Oxford: Berg.

Chatterjee, H.J., Hannan, L. and Thomson, L. (2015) 'Introduction to Object-Based Learning and Multisensory Engagement'. In H.J. Chatterjee and L. Hannan (eds) *Engaging the Senses: Object-Based Learning in Higher Education*. Farnham, Surrey: Ashgate, 1-20.

Chatterjee, H.J. and Noble, G. (2013) Museums, Health and Wellbeing. Farnham, Surrey: Ashgate.

Cook, T. (1997) 'What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift.' *Archivaria*, 43, 17–63.

Dobrzynski, J.H. (2014) 'Modernizing Art History'. *Wall Street Journal*, April 28, 2014.

Gardner, H. (1993) *Frames of Mind*. New York: Basic Books.

Impey, O., and MacGregor, A. (ed.) (1985) *The Origins of Museums: The Cabinet of Curiosities in Sixteenth and Seventeenth-Century Europe*.

Jandl, S. and Gold, M.S. (eds) (2012) *A handbook for academic museums: exhibitions and education*. Edinburgh: Museums etc.

Kolb, D. A. (1984) Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, N.J: Prentice-Hall.

Long, M. and Schonfeld, R.C. (2014) 'Supporting the Changing Research Practices of Art Historians'. Ithaka S+R Research Publication, April 30, 2014.

Meyer, J.H.F. and Land, R. (2003) 'Threshold concepts and troublesome knowledge: Linkages to ways of thinking and practising within the disciplines', In C. Rust (ed.), *Improving Student Learning: Improving Student Learning Theory and Practice – Ten Years On*. Oxford: Oxford Centre for Staff and Learning Development.

Meyer, J.H.F. and Land, R. (2005) 'Threshold concepts and troublesome knowledge (2): Epistemological considerations and a conceptual framework for teaching and learning'. *Higher Education*, 49, 373–388.

Nyhan, J., Terras, M., Mahony, S. (2014) 'Digital Humanities and Integrative Learning'. In D. Blackshields, J. Cronin, B. Higgs, S. Kilcommins, M. McCarthy, and A. Ryan, A. (eds) *Integrative Learning: International research and practice*. Oxford and New York: Routledge, 235-247.

Pearce, S. M. (1993) *Museums, objects and collections: a cultural study*. New York: Smithsonian Institution Press.

Reeves, C. (2013) 'The importance of being blonde,' in *Conversation Pieces: inspirational objects in UCL's historic collections*. Oxford: Shire Publications.

Rodríguez, N., Baca, M., Albrezzi, F. and Longaker, R. (2012) 'The Digital Mellini Project: Exploring New Tools & Methods for Art-historical Research & Publication.' Paper presented at Digital Humanities 2012 conference, Hamburg, Germany. http://www.dh2012.uni-hamburg.de/conference/programme/abstracts/the-digital-mellini-project-exploring-new-tools-methods-for-art-historical-research-publication/

Rodriguez Ortega, N. (2013) 'Digital Art History: An Examination of Conscience.' *Visual Resources*, 29 (1-2), 129-133.

Standing Committee for the Humanities (2007) 'Position Paper.' Strasbourg: European Science Foundation. URL: http://www.esf.org/fileadmin/Public_documents/Publications/SCH%20Position%20paper_01.pdf. (accessed 10 November 2015).

Teitelbaum, M. (1996) 'Notes on the Meeting of Cultures.' In S. Watson, P. White and T. Hill (eds), *Naming a Practice: Curatorial Strategies for the Future*. Banff: Banff Centre Press, 40-44.

Terras, M.M., Bruchet, L., Malik, A., Collins, S., beavan, D., volley, J., Giacometti, A. (2015) 'Digital Humanities as Catalyst for Digital Art History: The Slade Archive Project'. *Digital Humanities*.

Tunbridge, J.E. and Ashworth, G.J. (1996) *Dissonant Heritage: the management of the past as a resource in conflict*. London: Wiley**.**

UCL Centre for Digital Humanities (2015) Website for the MA/MSc in Digital Humanities. http://www.ucl.ac.uk/dh/courses/mamsc (accessed 10 November 2015)

Weski, T., von Bismarck, B. and Schafaff, J. (eds) (2012) *Cultures of the Curatorial*. New York: Sternberg Press.

---

[1] Famous alumni include Gwen and Augustus John, Stanley Spencer, Ben Nicholson around the turn of the 20th century and early 1900's, Richard Hamilton and Eduardo Paolozzi in the 1940's, and Derek Jarman, Paula Rego, Euan Uglow and Craigie Aitchison in the 50's and 60's. More recent Turner Prize winning alumni include Martin Creed, Rachel Whiteread, Antony Gormley and Douglas Gordon.

[2] A commonly used term in the Gallery, Library and Archive and Museum sector to cover the period when an item is taken out of store for digitization or exhibition and when it is returned safely.