Integrative Learning

DIGITAL HUMANITIES AND INTEGRATIVE LEARNING

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INTRODUCTION

Whether in universities, cultural heritage organizations such as museums, libraries and archives, commercial contexts and even in individuals' homes the application of computing to cultural heritage is transforming how the human record can be transmitted, shaped, understood, questioned and imagined. The discipline now known as Digital Humanities (hereafter DH) has been carrying out interdisciplinary research involving scholars and practitioners from the aforementioned domains since at least 1949, when Fr Roberto Busa began work on an *index variorum* of some eleven million words of medieval Latin in the works of St Thomas Aquinas and related authors (Hockey, 2004). An increasingly mainstream area of academic research, in 2011 some 134 different academic courses offering DH were identified (Spiro, 2011) and anecdotally it is clear that this number has increased since.

The MA/MSc in DH in the Department of Information Studies, UCL was launched in 2010[i]. It is an interdisciplinary programme, exploring the intersection of digital technologies, humanities scholarship, and cultural heritage. Through it students with humanities backgrounds can develop necessary skills in digital technologies; students with technical backgrounds can develop necessary skills in humanities. It is designed to produce students capable of performing the roles of project manager, information specialist or researcher within the cultural and heritage industry. It also provides relevant skills for publishing, and for those wishing to work in the construction of computational systems for distributing and archiving vast quantities of information.

The course *INSTG008 Digital Resources in the Humanities* (hereafter DRH) is a core course for students on the DH MA/MSc and an optional course for students on other programmes offered by the UCL Department of Information Studies. Here we explore an exercise developed for the course that aims to fosters integrative learning via an object-based learning approach. This exercise, in turn, reflects some of the many ways that integrative teaching and learning is being incorporated into the MA/MSc in DH as part of a wider object-based learning context.

DRH AND INTEGRATIVE LEARNING: A RATIONALE

DRH aims to give students a solid grounding in the design, creation, management and use of digital resources in the humanities. It is taught for three hours per week over a ten week period and usually consists of a one-hour lecture followed by two hours of practical group work and instruction. Due to the protean nature and brisk pace of DH the content and scope of the course changes yearly. At the time of writing (2013-2014 session) lectures address fundamental concepts such as 'What is DH?', 'Digitization of Text, Image and Object', 'Geographical Information Systems', 'Text Analysis and Stylometry' and the 'Text Encoding Initiative'. These 'scene setting' and more abstract sessions are followed by practical ones, usually led by guest speakers who present real-world examples, applications and challenges to concepts and techniques introduced in lectures. Object-based learning sessions (of which one is described below), group work and four problem-based practical sessions are also carried out.

The rationale for aiming to foster integrative learning is based on two particular problems that, from the tutor's perspective, this course raises: how to leverage the potential of the complex contexts that the course is taught in and how to facilitate understanding of the course's main 'Understanding Goal' (over and above the course's particular Learning Outcomes (LOs). Both this Understanding Goal and

contexts require further elucidation in order to explain properly our rationale for this approach.

Disciplinary context

Integrative approaches to teaching and learning may be seen as optional extras for some disciplines, in DH they are but a jumping off point. While definitions of what exactly DH is are many and contested (see, for example, Terras et al., 2013), we can make a number of observations about its forms, contexts and problems. DH takes place at the intersection of digital technologies, humanities and cultural heritage. Notwithstanding the ubiquity of computing in all aspects of academic life, DH usually involves specialist or emergent applications of computing tools and techniques to research problems of the Arts and Humanities (or vice versa). In doing so it often operates in contexts that are related to, but somewhat different from the traditional humanities. The kinds of 'hands on work' that some DHers do, for example, building digital tools, questions the breach between making and thinking that is long held and indicative of traditional Humanities research (see, for example, Galey and Ruecker (2010) and Turkel (2008)). So too the intellectual, institutional and technical conditions required to carry out DH can be different to those of the traditional Humanities. While traditional Humanities research has, officially at least, been seen as the preserve of universities and academies, DH research is often collaborative, interdisciplinary, transinstitutional and sometimes

extramural (see, for example, Warwick et al., 2012). It is essential that students are made aware of these issues by looking at practical, real world examples of digital and real world projects and practices and by having the opportunity to explore ways of thinking through, between, beyond and around them. In essence, we must ensure that they understand the fundamental similarities and differences, assumptions and requirements, whether in a practical, theoretical or philosophical sense, between, for example, a hard copy dictionary used in scholarly research and its electronic surrogate or a museum object and it 3D representation made for the general public rather than museum professionals. This is essential because DH specialists will not be able to conceptualize or build digital tools and artifacts that push forward the state of the art if they do not properly understand the tools and artifacts that have been used in scholarly research since at least the thirteenth century, and in some instances, considerably longer. Equally, in order to develop skills and knowledge to push beyond the state of the art students must become self-aware and self-directed learners who can respond to complex, real-world problems by effectively integrating their domain knowledge, practical skills (e.g. programming and coding), critical understanding and creativity. It is in facilitating such learning that integrative learning is so powerful:

> ‘Significant knowledge within individual disciplines serves as the foundation, but integrative learning goes beyond academic boundaries. Indeed, integrative experiences often occur as learners address real-world

> problems, unscripted and sufficiently broad to require multiple areas of knowledge and multiple modes of inquiry, offering multiple solutions and benefiting from multiple perspectives.'
>
> (Huber and Hutchings, 2005: p.13)

Institutional context

UCL's local and institutional context is an important consideration too: not only do we attract a primarily international student cohort but the MA/MSc resides in an Information Studies department. A number of students accepted onto the programme already have PhDs or extensive professional experience while others come straight from undergraduate degrees. And, as mentioned above, we accept high-achieving students with backgrounds both in the Humanities and Sciences. This makes for a teaching and learning context that is most challenging but, under the right circumstances, can be rich, exciting and productive. Tutors must not only plan and prepare well but they must also cultivate a relaxed and open learning environment where students are challenged and stimulated, able to draw on and contribute their real-world experience, but not overwhelmed. In such a context is is crucial to foster one of the key outcomes of integrative learning: that is students' capacity to "make connections for themselves" (Huber and Hutchings, 2005: p. 5.); examples of this will be illustrated below.

Teaching for Understanding context

Given all of the considerations above, the course's Understanding goal is to foster among students a deep critical understanding of the many contexts, forms and formats that Cultural Heritage artifacts (in the broadest possible sense) exist in and are informed by and how this, in turn, influences the ways they are and can be used in the traditional and digital humanities. One of the most difficult aspects of teaching for this goal lies in drawing out and exploring the understandings of both digital and analogue objects that students often bring to the course. The difficulty lies in the reality that, for reasons that are outside the scope of this article, a number of students begin the course with entrenched and often unquestioned assumptions about the physical and digital as being in an oppositional and hierarchical relationship. Depending on their sensibility, the digital may be seen as revolutionary and the analogue as inadequate, or vice versa. Such polarized views can ultimately stunt thinking, learning, collaboration and creativity. So, a key aspect of the tutor's work lies in cultivating a kind of 'productive unease'[ii] that disrupts inherited narratives and exposes tensions and complicating factors while scaffolding students towards developing more objective and disciplined modes of evaluating digital and physical cultural heritage artifacts. This 'productive unease' plays a key feature in the integrative learning exercises designed for the course and described in part below.

BACKGROUND

One of the most fundamental challenges of teaching this course is addressing the above-mentioned fragmentary understandings of digital and analog cultural heritage artifacts that students may have. A first step towards this, taken on the first day of class, involves creating opportunities for students to firstly articulate and then reflect on their current understandings of such resources. We address this via an exercise that introduces students to structured ways of evaluating physical and digital cultural heritage resources and opens possibilities for their personal, and thus differing viewpoints and interpretations to be expressed and debated.

In the anonymised comments excerpted from reflective student blogs written after this exercise we can see how students are prompted to reflect on the nature of their understanding of such resources (on the first day of class). For example:

> "Initially I gave a very broad definition of Digital Humanities. […] However, the lecture earlier and the British Museum website take a far more 'all human life is here' type approach. Eg. Everything which pertains to humanity falls within the remit of The Humanities. Which is rather exciting!" (Student 4/10/2013)

> “I had never realised that the difficulty of identifying the author of entries on such a prominent site when trying to justify its use as a source in the humanities. I had always considered the source the object itself, rather than the text beside it.”
>
> (Student 4/10/2013)

Also notable is how group work facilitated integrated learning by allowing alternative viewpoints to be introduced and discussed. For example:

> “Our group disagreed slightly on the broad scope of the site: some members felt that the extensive list was a negative, while others liked the idea of jumping from one discipline to the next, and the ability to move into different corners of scholarship from a single page.”
>
> (Student 4/10/2013)

> “We had a moment of disagreement in our group about "searchers" v "browsers" and I am definitely a browser.”
>
> (Student 4/10/2013)

In the next excerpt we can especially see integrative learning taking place as the student begins to interlink how understandings of the role of digital and analogue artifacts can prompt reflection on wider issues of what the discipline is:

> "I don't feel that I can fully trust a site that has seen very little development in a decade, which is slightly ironic, since I get the sense that the people making the site and curating the content are very trust-worthy sources (academics). Maybe this disconnect is at the heart of the strange division between new technology and a lot of the humanities? (and what we're here to work against?)"
>
> (Student 4/10/2013)

This course includes a core set of fundamental information that students must learn to complete it successfully, for example, the basics of digitization. Yet, a core aim of it is that students who complete it successfully should leave with more questions than answers, for this is how DH really is beyond the classroom context. This exercise introduces students to 'disciplined' thinking by asking them to describe and evaluate real-world examples of DH tools and techniques using questions typically asked within a disciplinary setting and using questions to which there is not one right answer only. As the course progresses students

growing understanding of all aspects of DH is gradually explicated, refined and problematized. This is exemplified in the case study below.

Object-based learning and its role in facilitating integrative learning in DH

The case study described below uses an object-based learning approach to foster integrative learning and the notion of 'productive unease' described above among students on the MA/MSc in Digital Humanities.

In UCL we are privileged to have extensive Special Collections and Museum holdings. Special Collections alone holds "half a million items dating from the fourth century to the present day"[iii] UCL's three museums[iv] (the Petrie Museum of Egyptian Archaeology, the Grant museum of Zoology and UCL Art Museum) were originally established as teaching collections; notable too are the so-called 'hidden collections' which are available upon request but not on permanent display. This case study describes a two-part integrative learning session that takes place over six contact hours and makes extensive use of object-based learning in order to facilitate integrative learning. Object-based learning involves:

> 'Using objects in teaching [and] can develop core skills including team work, evidence-based learning, and communication, as well as key research

skills such as data collection and analysis, practical observation and drawing skills, literature review techniques and subject-specific knowledge. It can also trigger innovative dissertation topics.'[v]

The first part of the session takes place in the Grant Museum of Zoology (or the Petrie, depending on availability). In preparation, students are asked to read various texts that discuss particular artefacts held in the museum. They are also asked to locate, in advance of the visit, named specimens in the museum's online catalogue and to reflect on the nature and effectiveness (for research and teaching) of their digital surrogates. [vi]

On the day of class they are given time to try to locate in the museum the artefacts that they viewed online (indeed, given the different logical organizations that can underpin museum displays this is invariably a challenging task that prompts students to ask why displays are organised as they are instead of taking such displays as a given). In the class seminar that follows, led by Grant museum curator Mark Carnall, they not only compare and contrast the digital representations and organisation of the specified digital and analogue artefacts and systems but also consider complex issues around the role of digitisation in natural history museums.

The kinds of integrative learning that takes place is, to some extent, captured in the reflective blogs that students write after the session. For example, in the comment below we can notice how the student reflects on the experience gained during the session and combines this with their learning on the course in order to identify new ways of approaching the digitisation of cultural heritage materials. We can also see evidence that the Understanding Goals of the course are, in many cases, being met as students express critical and yet balanced judgements of both the digital and analogue:

> "Generally, if you ask someone to summarise a new thing learned after visiting a museum, you would expect to hear a fact or anecdote about the subject matter of the collection. in the case of the Grant Museum, I learned far more about curation of museums and what goes in to producing and maintaining works and collections, than I did about the many bones and bodies stored in the cabinets. …. This format of museum actually left me with more of an impression of the museum as a whole; the strange atmosphere and the feeling of wonder the bizarre menagerie of beasts evoked in me left an imprint, I think precisely because I hadn't overburdened myself with facts and figures from the displays. I think conveying this sort of holistic, almost emotional impression to patrons is a vital element that museums should concentrate on, as it is the one thing that is lacking in the collections housed in the digital realm."
>
> (Student, 12/12/2013)

Further evidence of the student grasping the Understanding Goals of the course can be noticed in the following excerpt too:

> "Hence, the actual trip to the Grand Museum did justice to the digital surrogates that left me unimpressed during my virtual visit due to the static nature of the online catalogue. Perusing the online catalogue and the actual visit are I believe two complementary practices. Whilst the first provides us with multiple micro-narratives dispersed across the digital platform, the latter articulates a greater, all-encompassing scientific narrative as it was originally conceived by the museum's founder, R.E. Grand in the 19th century."
>
> (Student, 12/12/2013)

The final comment included here points to the ways that integrative learning that is implemented via an object-based learning model can open a new set of opportunities for students to apply their in-class learning to real world problems and environments:

> "I have always cherished the times we went on the excursions to the museums in this course, both at the Galton Collection and the Grant Museum. I think it is very helpful to be able to make the comparison myself between the digital version and the actual object itself to understand the difficulties of digitizing a collection. It is also very inspiring and helpful to

> be able to interact with museum and digitisation professionals and see what they work is ... The trip also gave me a sense of the magnitude of challenges museums are facing nowadays such as how to present and select items from a museum's collection and how to promote the museum."
>
> (Student, 12/12/2013)

The second part of the session described here is based around another object-based learning led by a museum curator followed by a 45 minute problem-based practical session in a computer lab and a 45 minute class discussion to close.

Sir Francis Galton (1822-1911) was a complex and flawed figure (see, for example, Brookes, 2004). He made fundamental contributions to many areas of science such as statistics, meteorology and criminology; for example, he applied statistical methods to the analysis of raw data, thus developing the science of finger printing.[vii] However, his main area of interest was heredity. He 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.'[viii]

At the time of his death in 1911 he left a collection of objects to UCL, the Galton laboratory already having been amalgamated into UCL in 1904. This collection now forms the Galton Collection. In contrast with the Grant Museum referred to

above, the Galton Collection does not have a dedicated museum space and is not open to the pubic but may be viewed upon appointment. Items from the collection have been digitised and are available online but the catalogue is extremely difficult to use without prior knowledge of its contents[ix].

For this session the only advanced preparation students are asked to do is to be aware that they may find aspects of the collection unsettling.[x] For the 2013-14 session the curator of the Galton Collection presented a bespoke session in class where students were able to handle selected items from the collection. An object discussed at length was Galton's so-called 'Pricker Gloves',[xi] which are cotton gloves with a strip of felt on the inside that a strip of paper or card can be affixed to. A small needle on the inside of the thumb allows pricks to be made in the card in order to count what is being observed. After presenting the gloves to the students and giving them time to speculate on their uses (as yet unknown to the students) the curator explained that these were used by Galton to secretly record his evaluation of the physical appearance of women who passed him on the street and this data was subsequently used in his "beauty map" of Britain.

In the practical session afterwards students are asked to locate the digitised version of the gloves in the Galton online catalogue. The image in the online collection gives no indication of the mechanism on the inside of the gloves and in it the

gloves appear different in colour and texture form the real-world items. Most notably, in place of the rich, wide ranging and expert discussion from the curator the online image is accompanied by the sparse description: 'Pair of gloves with pricker in the thumb. Pair of yellowish cotton gloves adapted with grey felt for card and pricker in thumb. Other observations: For counting (e.g.) types of people etc. in street'[xii]

These gloves may be distasteful but they are not unsettling; nevertheless, in their counting mechanism they point to eugenicist ideology and experimentation which could involve crude acts of quantification and classification in order to dehumanise others. Indeed, when students are later in the session shown the *Haarfarbenfafel*, a tin box containing some thirty samples of hair types and bearing the name of Prof Dr Eugen Fischer (who went on to join the Nazi party and to commit horrific crimes) the unsettling nature of this collection and the links (complex and disputed as they may be) between eugenics, Nazism and genocide are laid bare.

The class discussion that follows the problem-based practical again offers students the opportunity to display their learning and apply it to new contexts; for example, we discuss strategies for digitising the items in the collection like the 'pricker gloves' so that their digital surrogates would be adequate for use in research and

teaching. However, the input of the curator, the sensitive nature of the collection and its 'upon request' status prompted yet a deeper and more nuanced debate of the strengths and weaknesses of both the digital and physical media and environments. In much of the scholarly literature digitization is almost invariable spoken of as an unqualified good. This object-based learning exercise prompted students to question this assumption and it's far reaching implications. Other issues raised and debated by students included the invaluable human insight that is difficult to capture in either the physical or digital museum exhibits along with reflections on how cultural heritage knowledge is both constructed and communicated in formal and non-formal settings and institutions.

In short, this exercise empowered students to work together to experience and then collectively debate aspects of the digital and analogue that the lecturer would find extremely difficult if not impossible to do in the context of one-way transmission such as a lecture. These sessions, therefore, are integral to our teaching in DH, and to impart knowledge to students that:

> 'The digital historical object can exist in many realms and perform many roles that go beyond representation, interpretation, education, documentation, and archive. Indeed its analogonic role is potentially diverse [...] the status of copies from nondigital originals still remains ambiguous [...] A range of expanded meaning, material characteristics, and behaviours

emerge as representing a particular configuration of space, time, and surface, sequence of user activities – a particular formal material and user experience.'

(Cameron, 2007: p 68)

Without involving our students in the handling and examining of real objects when confronted with the virtual they would not be able to rationalise and encounter this complex relationship. By doing so they may reach an understanding of the 'modality and materiality of digital historical objects" as "new roles and a set of defining characteristics emerge beyond their role as servant to the 'real' as representation, presence, affect, experience, and value' (Cameron, 2007: p. 70).

EMERGENT FINDINGS AND FUTURE DIRECTIONS FOR EMBEDDING INTEGRATIVE LEARNING IN THE DISCIPLINE

DH as a field has always had a more "hands-on", practical element than other areas of humanistic study, due to the fact that students need to carry out their work with computational techniques, which sit at the boundary of the physical and the digital. Looking to the international context we increasingly see a move towards 'maker spaces' and labs which also can afford rich integrative learning experiences, such as, among others, Humlab at Umea University[xiii]. The role of

desktop fabrication within humanistic research is being explored by William J. Turkel (and students/national and international collaborators) in the history department at Western University, Canada. ((http://williamjturkel.net/2011/12/17/designing-interactive-exhibits/):

> 'Academic historians have tended to emphasize opportunities for knowledge dissemination that require our audience to be passive, focused and isolated from one another and from their surroundings. When we engage with a broader public, we need to supplement that model by building some of our research findings into communicative devices that are transparently easy to use, provide ambient feedback, and are closely coupled with the surrounding environment.'[xiv]

These two projects are leading the way into using purpose built labs for experimentation of the relationship between culture and technology in an integrative environment: and we suggest that, coupled with the use of special collections, as we show above, this type of development opens new directions not only for research but also for developing research-led DH curricula that draw extensively on integrative learning approaches.

WIDER SIGNIFICANCE OF THE TECHNIQUE FOR INTEGRATIVE LEARNING PEDAGOGIES

The techniques discussed here demonstrate that object-based learning can offer tutors a considerable range of opportunities for designing integrative learning sessions to stretch students and strengthen their learning and understanding in ways not otherwise possible.

UCL's museums are then a place for integrative learning in the broadest sense of the term: such teaching can lead to all manner of further activity and learning for students and tutors, including research, outreach and public engagement, furthering the usefulness of university museums for society:

> 'University museums should embrace the opportunity they have to be experimental spaces that form a link between academia and the public. Not only may such activity make university museums more relevant to their institution's research agenda, it also holds the potential for cementing a place for university museums within the cultural sector supply chain as key incubators of new ideas and approaches for increasing visitor access, engagement and overall sustainability.'
>
> (Nelson and MacDonald 2012: p. 440).

The object-based learning approaches to integrative learning described here open new ways to integrate integrative learning in to University teaching and, in doing so, to engage a wider and richer range of colleagues and departments that might otherwise be the case.

CONCLUDING REMARKS

The incorporation of integrative learning strategies into University teaching requires a significant time commitment and one may reasonably wonder whether that time is justified, especially in a research-led university such as UCL.

It is notable that overall the feedback for this module has been extremely positive with more than 75% of students stating that they had learned more or a lot than expected. A majority of students found the teaching to be 'excellent' and felt that student participation was highly encouraged. Aside from this, by embedding ourselves in such teaching, the academics on the programme have learned much about UCL's collections, and potential therein for research and development. Indeed, it has opened unexpected benefits for academic staff by encouraging relationships across campus which has led, for us, to successful research projects which further feed into teaching and learning. Stepping outside the lecture room to teach, away from traditional lectures and tutorials, has benefited both staff and students, in a virtuous circle.

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[i] See Programme page: http://www.ucl.ac.uk/dh/courses/mamsc accessed 04/11/2013
[ii] This term is take from an article by Flanders (2009) though used here in a somewhat different sense.

[iii] See http://www.ucl.ac.uk/teaching-learning/news/a-very-special-collection) accessed 25/10/213
[iv] http://www.ucl.ac.uk/museums
[v] See http://www.ucl.ac.uk/teaching-learning/teaching-learning-methods/object-based-learning accessed 25/10/2013
[vi] See http://gmzcat.museums.ucl.ac.uk/ accessed 21/10/2013
[vii] http://www.ucl.ac.uk/museums/galton/about/collections
[viii] Ibid
[ix] See http://galtcat.museums.ucl.ac.uk/search.aspx accessed 20/10/2013
[x] For example, they will view objects such as '16 glass eyes in tin' (354; see http://galtcat.museums.ucl.ac.uk/detail.aspx?parentpriref=) all numbered according to race, where foreshadowings of the later appropriation by of the work of Galton and other eugenicists by Mengele and the 'research' of the Nazis is unavoidable (see Gillham 2001 and cf Challais 2013). Indeed, this points to an interesting issue about ethics and the limits of integrative learning that is outside the scope of this paper

[xi] http://galtcat.museums.ucl.ac.uk/detail.aspx accessed 20/10/2013
[xii] http://galtcat.museums.ucl.ac.uk/detail.aspx# accessed 20/10/2013
[xiii] See http://www.humlab.umu.se/en (accessed 25/10/2013)
[xiv] See http://williamjturkel.net/2011/12/17/designing-interactive-exhibits/ (accessed 25/10/2013)