From historical inquiry to e-learning: understanding the metaliteracies and digital capabilities required of researchers of tomorrow

The aim of this article is to share some of the key messages from my various conference presentations this year, including a co-presentation with Dr. Tom Woodin, Reader in the Social History of Education at the UCL Teaching and Learning Conference in April 2016. Other presentations took place at the INFORM2016 conference in Prague (where I gave the opening keynote and also ran a workshop on information literacy teaching), at DARTS5 which is run by CILIP's Academic and Research Libraries held at the beautiful venue Dartington Hall, in Totnes, at EdTechXEurope when some delegates visited the UCL Institute of Education (IOE) and at the IOE's Digital Roadshow. A summary of these key messages was published as an editorial for UKSG eNews, Issue 377, 5th August 2016.

The thread that runs through the talks are the key findings from various online user behaviour studies. However, for the sake of brevity, I will highlight the 2012 'Researchers of Tomorrow' study published by the British Library and JISC in this write-up. The 'Researchers of Tomorrow' was the first large-scale, longitudinal user behaviour study (conducted over three years), which considered the information seeking behaviours of 17,000 PhD students at 70 different HEIs. The findings are particularly relevant to my day-to-day work supporting the PhD students at the Centre for Doctoral Education at the UCL Institute of Education IOE. The key findings from this study are:

1. These students are heavily reliant on secondary sources;
2. They find access to relevant resources a major constraint;
3. They are confused about open access and copyright which stops them from networking and collaborating;
4. They do not use the full potential of innovative technology; and
5. These students are insufficiently trained to be able to fully embrace the latest opportunities in the digital information environment.

Let me look at each one of these in turn – and highlight the messages I had for the different audiences who were made up of librarians and information specialists, publishers, academics and support staff and e-learning content providers.

1. Students [and researchers] are heavily reliant on secondary sources

In response to the first finding that doctoral students are relying heavily on secondary sources, concern was raised about the potential lowering of quality of scholarly output in the UK if doctoral students were simply regurgitating content available in secondary sources. At the UCL Teaching and Learning Conference in April 2016, I focused on the importance of historical inquiry for developing analytical and critical literacy skills through the use of primary sources. Dr. Tom Woodin and I highlighted the possibilities of finding new ways of looking at the old, and for my part, I used as my case study the research that I had conducted on one of the IOE's Special Collections, the Hayward Collection (this is the personal library of F. H. Hayward, a Schools Inspector for over thirty years with the London County Council). I explained that by interrogating the books in his personal library, particularly the marginalia and the press cuttings pasted into the covers by Hayward, I was able to piece together information on Hayward's thinking and find out about the people who influenced him - information which had hitherto been undiscovered. Had I stopped researching Hayward after using all the available secondary sources, I would have missed vital information on the significance

of Hayward's work towards developing an early 20th century multidisciplinary curriculum for moral education and education for citizenship in secondary schools. This is because there were only a few passing references to Hayward in the books and articles that I looked at. The importance of historical inquiry is beginning to be recognised by many subject areas, including computer science and medical education – the relevant subject associations see history as a necessary component in the curricula as it promotes a wider understanding of the subject.

My purpose in including this message was twofold: to highlight both the relevance of historical inquiry to developing analytical and critical skills to information literacy and to point out that too often libraries spend large amounts of their budgets on purchasing secondary digital sources at the expense of expending some of their resources on descriptive cataloguing and digitising these hidden collections (for more information see: Research Libraries UK's report on Hidden Collections (2010)). Further, since many students are now distant users, the potential for digitizing collections for preservation, has the added benefit of enabling wider access and promoting the library collections thereby increasing the quality of scholarly output. In order to showcase our own historical collections, a newly created IOE LibGuide on historical sources was presented to academics and students at the conference – see: http://libguides.ioe.ac.uk/historysources.

2 Students [and researchers] find access to relevant resources a major constraint

INFORUM Prague 2016

In my keynote presentation at the INFORM2016 conference, I focused on many issues including that of access which is highlighted in the 'Researchers of Tomorrow' study. Today our users want access to information resources anywhere, anytime and from anyplace. However, access continues to be problematic and for many users is the key stumbling block between accessing library-subscribed resources and going on the internet to find content for their academic work. Users are constantly faced with virtual door shutting on them – whether this is because of the myriad usernames and passwords they have to use and remember and/or because there simply is no single standard for a publisher's website or an ebook portal.

The lack of standardisation is something that was highlighted by the User Behaviour in Resource Discovery report too. It is the sheer frustration that many users feel that takes them away from the library's digital resources to Google, Wikipedia and illegal hubs such as Sci-Hub. Publishers may blame libraries for not providing the appropriate training but it is the publishers themselves who have created this problem in the first

place by not allowing us to take control of our digital library (just as we have control of our physical spaces). We need more Apps such as Browzine to ensure users have *seamless access* to the digital resources we spend so much on acquiring.

We also need to focus more of our resources on promoting open access within our institutions and collaborating with academics on creating open education resources such as DERA (the digital education resource archive was created by librarians at the UCL Institute of Education to save from extinction the born digital content on education created by the UK government) and some of the IOE LibGuides (such as, for example, Children's Book Corner, Early Literacy Attainment and OER for Educationists).

My message is that today, our role is not just one of simply being custodians of collections, but one of curators and educators. By selecting content that is appropriate for academic study and creating these open education resources, we are sharing our expertise more widely, not just with teaching staff but also with learners who may not be able to come onsite or are based in other parts of the world.

3 Students [and researchers] are confused about open access and copyright which stops them from networking and collaborating.
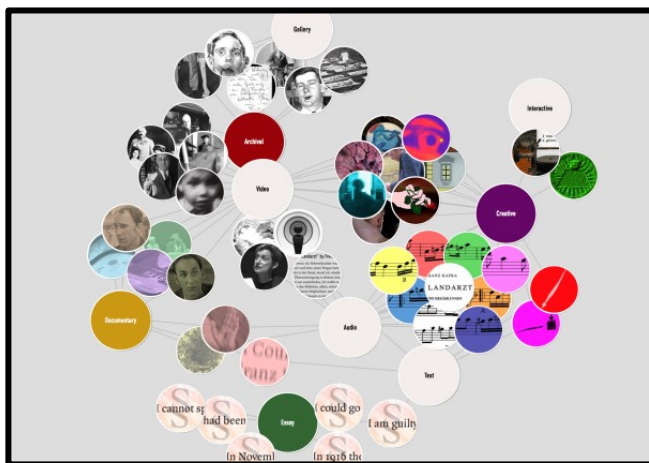
'Kafka's Wound' A Digital Essay by Will Self

In addition to the above and in line with the findings third and fourth finding from the 'Researchers of Tomorrow' study, I also focused on the multiple literacies required today in a constantly evolving information world. As Thomas Mackey and Trudi Jacobson state in their book,[1] information is a dynamic entity that is produced and shared collaboratively on various platforms and in different formats. These require us to be not just information and digitally literate but also to be visual, media and cyber literate.

Increasingly, our users need to understand intellectual property rights, including copyright, and the ethical use of information in order to allow for the reuse of content, which is so widely being shared over the social web. It is also about learning when and how to cite content. I used Will Self's digital essay *Kafka's Wound* as an example of the digital capabilities required today and to illustrate the possibilities of what can be achieved in terms of a digital publication, which includes content from primary and secondary sources as well as user-generated content. All of this requires an understanding of intellectual property rights, not just in the UK but in the countries where the content is going to be used.

**Information Services Division Digital Roadshow
UCL Institute of Education**

 I took the theme of digital capabilities further in my talk at the Digital Roadshow @IOE where I focused on developing the digital researcher.

 I discussed the six elements in JISC's digital capabilities model. I did not use the original circular diagram which suggests a circular path but separated the six elements into a list (information, data and media literacy, digital creation, innovation and scholarship, digital communication, collaboration and participation, digital learning, self-development, digital identity and wellbeing and of course, ICT proficiency which is required for all of these elements) simply because what one embarks on first, very much depends on the end results and what the researcher wants to achieve.

I highlighted the need for expert opinion to be readily available on the Internet so that the problems that had resurfaced during Brexit, particularly with respect to incorrect information being bandied around as fact, could be avoided. It is incumbent upon researchers to use as many of the new forms of communication technologies to disseminate research findings and communicate expert opinion in language that is clearly understood by the public. This requires the use of the relevant communication technologies used on the social web. Twitter, in particular is currently one of the most powerful of these platforms and has been used to engage the public to take action, revolt, organise movements etc. Twitter and other social networking platforms allow for networking with other researchers and potential collaborators. It has been found that research projects that are collaborative, particularly with international partners, have a higher citation rate than research that is conducted by individuals based at a single institution. [2]

Thus use of the social web has dual benefit of getting research 'out there' and engaging with the public. It has been found that researchers are more likely, in fact, eleven times more likely, to get cited if their work is tweeted about.[3] The importance of engaging with the public is urgent. The impact agenda for REF2014 attempted to engage with the public by publishing case studies demonstrating the impact of research on society. It is more than likely that REF2021 will make more of this. Further, the mandate to make REF-able research open access for 2021 will also ensure wider dissemination of research.

In relation to this, I talked about the paradigm shift in publishing: It can take up to two years to get a paper published in a top peer-reviewed journal. However, developments in communication technologies allow for almost instantaneous publication of user-generated content whether it is in the form of blog posts or comments. In addition, with the interactive social web, the potential exists to have multi-dialogues, anywhere, any place and at any time.[4] Research findings can also be disseminated in different formats such as, for example, a video of an abstract for a research paper/project. Given that 25%

of mainstream academic content is not read outside of academia,[5] it is all the more reason for researchers to be using the social web to promote their work.

In addition to public engagement, there are other benefits for researchers to develop their digital capabilities. New technologies such as data/text mining can enhance ways of analysing research data which in turn can innovate research methods. Similarly, researchers that want to make their data open access to enable further analysis through re-use will need to learn about research data management and the associated ethical issues.   These are some of the benefits of researchers developing their digital capabilities.

4 **Students [and researchers] do not make use of the full potential of innovative technology**
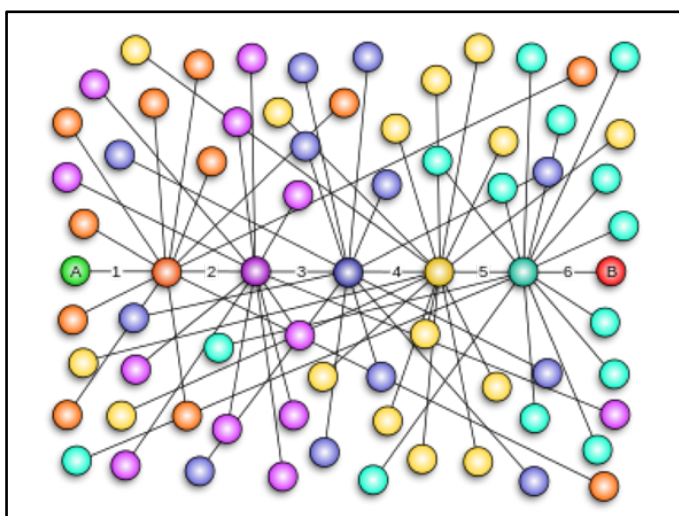
Six Degrees of Separation in Social Networks

CC-SA 3.0 Dannie Walker

Still focusing on digital capabilities, I explored further the power of the social web for sharing and networking and how it can no longer be ignored and therefore underestimated.

In 1929, the Hungarian author, playwright, poet, journalist and translator came up with the six degrees of separation theory in his short story 'Chains'. The theory proposes that everyone and everything is six or fewer steps away from each other by way of introduction. Tested by the psychologist Stanley Milgram in 1967 but considered an urban myth by Judith Kleinfield,[6] six degrees continues to be a popular way to measure degrees of separation for social networks. For instance, a group of international researchers found that on average, networks on Twitter demonstrate 3.43 degrees of separation[7] and 4.74 on Facebook.[8] LinkedIn is itself based on this theory with its grouping of first, second and third connections. The message is simple: social networks are powerful – and Twitter is one of the most powerful of these new technologies. It is therefore advisable not to ignore even the weakest link in your connections.

Researchers and students often complain to me about the lack of time in establishing their digital identities on the social web. My message to them is that if they don't jump on this bandwagon, they will soon get left out as other experts will take their places – one researcher found that she was forced to engage on Twitter as her work was being discussed online. Not surprisingly, alternative metrics are now being used to measure research activity online and this is gaining ground as many publishers are now showing alternative metrics on their journal websites. These Altmetrics, as they are now referred to, track impact by counting the number of times research is mentioned (through tweets, retweets, likes and shares on social media), downloaded on bibliographic

referencing sites such as Mendeley and CiteULike and/or discussed in the news and in policy documents.

Researchers must also understand that the digital environment is not static. Change is constant and therefore, as Alvin Toffler wrote I this book *Future Shock* (1970) (quoting the psychologist Herbert Gerjuoy), "the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn". There is a tendency to think that once we've learnt something that is the end of the story. Actually, the story could get more interesting if we change our mindset and learn to experiment by unlearning and then relearning so that we can apply digital solutions to existing frameworks. However, central to this is digital wellbeing. We all have a lot more work to do today. It is important not to be a slave to technology but to use it to benefit us. Some of the technologies can be used to automate tasks. For example, tweets can be set up so that they are fired off at the most opportune times – say, for example, when the other side of the world is waking up to ensure maximum exposure. A blog can be set up so that when a post is published, an alert is sent to both Twitter, to Facebook and to LinkedIn. Thinking strategically about the audience and how best to make use of new technologies given the limited time we have is an art that needs perfecting and one that requires thought. This is also an important aspect of researcher development. Too often we are in a hurry to get things done as quickly as possible having a strategy in place will ensure that scholarly output and expertise have maximum exposure and visibility in the appropriate channels.

5 Students [and researchers] are insufficiently trained to be able to fully embrace the latest opportunities in the digital information environment
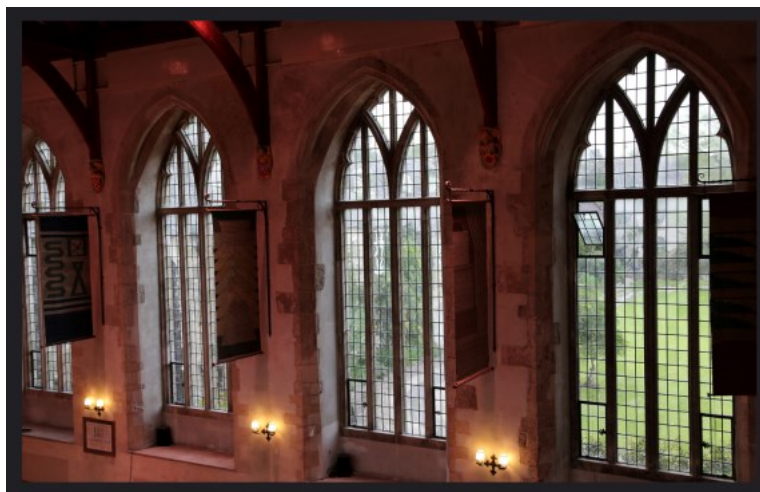
The Great Hall at Dartington, Totnes

At the INFORUM2016 workshop in Prague on ways in which to enage students in information literacy and at the DARTS5 conference held at the beautiful Dartington Hall, I used as a case study my online course 'Information and Literature Searching' to discuss the fifth finding from the 'Researchers of Tomorrow' report. In 'A framework for an online Information and Literature Searching' I highlighted the importance of engagement in the online environment in order to enrich the e-learning experience of students, whilst at the same time developing their information and digital capabilities.

The course itself is underpinned by the five key findings in the 'Researchers of Tomorrow' study and in setting it up, I mapped each of the key five findings against the elements that make up the course. The UCL IOE's LibGuides, LibAnswers and Library blog, Newsam News, as well as demonstration videos on YouTube scaffold the learning

on the course. For their first task, students are asked to read a couple of articles on the literature review, its role and how the literature review is assessed. This is of immediate relevance to students who know that the literature review is central to their thesis. Students are asked to find theses in their subject area and assess one based on the criteria offered by the authors of the two articles that are listed in the core readings section. This begins to develop their critical literacy skills. As the course progresses, students are asked to consider the relevance of historical inquiry to their research question and find primary sources that could be useful for their research. This exercise is important not only because it ticks one of the shortfalls that the 'Researchers of Tomorrow' report identified but also because historical inquiry allows students understand how language changes and the fact that words and phrases can come in and go out of fashion. One international student on the online PhD course wrote the following in relation to the case study she had read on historical inquiry and on her assignment to search for primary sources:

> *I am inclined to agree with the authors on the relevance and significance of historical inquiry. My research is on a framework for the development of professional identity and efficacy of the 21st century music teacher in Singapore. While historical inquiry would not be the dominant research methodology for such a study, I reckon that the historical inquiry could enrich and inform my literature review. For example, I could look into the National Archives in Singapore since the context of my research is Singapore. A quick search online brought me to potentially useful primary sources such as oral history interviews with different music teachers related to music education, which I might be able to investigate how these personalities grew their professional identity. Some of the transcripts were also available online...*

During the course, students develop an understanding of how information can be disseminated, what new technologies can be used for managing information using bibliographic tools and alerting mechanisms and also how they can establish their digital identities in order to share information and network with other researchers working in their area. Students also learn about intellectual property rights, copyright and the ethical use and re-use of information in different formats.

I explained how the e-learning environment needed to be 'trigger rich' to ensure serendipitous findings by students and used my Twitter feed (which is embedded into the course) as a way of suggesting additional readings relevant to the topic being discussed. In doing this, I 'prepared' the students so that they may experience serendipity. This is particularly important for e-learners who are not able to use the University's physical library. Unlike the students who are onsite, these e-learners do not have the same experience of walking through shelves where a book can catch their eye and a connection is made. The concept of preparing one to experience serendipity is not new. However, according to Jack Lynch, Professor of English at Harvard University, believes that the eLearning environment is not sophisticated enough to enable this. In his recent book, *You Could Look It Up: the reference shelf from ancient Babylon to Wikipedia* (2016) states the following:

> *The serendipity of browsing has yet to be successfully recreated in electronic form. An online encyclopedia can show you links to related articles, but what about all the unrelated ones? The printed codex allows its user to gain an impressionistic overview of the whole, and to skim through at high speed until something intriguing catches the eye: something that no online resource can replicate... For in*

a world where we can search for anything, it is getting harder and harder to happen across what we never knew we wanted to know.

Of significance is the fact that McCay-Peet and Toms (2015) found that researchers were more likely to experience serendipity if they were 'prepared' to expect chance findings.[9] They were not the first to discover this for the notion of the 'prepared mind' goes back to the work of two scientists, Barber and Fox, who provided evidence of this in 1958.[10] Therefore it is important for us, as educators, to ensure that the technologies we offer our researchers and students in discovery are 'trigger rich' to enrich their search experience. Using tag clouds and Amazon-like algorithms with an element of 'fuzziness' (more on this topic has been written Maloney & Conrad, L. Y. (2016)) to suggest content is one way in which we can do this and another is to include citations and Altmetrics in our discovery systems. Yet another way, which is often neglected and is quite literal, is to ensure that students are trained to 'read the screen' so that they can see whether the article they have found is one of many in a themed issue on their research topic. As one of the earliest online user behaviour studies confirmed, The Google Generation (2008), most users have a tendency to click and download without reading the screen – which is my experience of users even today. These seemingly small gestures go a long way towards ensuring students stay within the library to access content and can experience serendipity in their online searching.

Conclusion

In conclusion, I believe it is important for us to revisit the issues that I have raised above: our unique collections and the importance of historical inquiry, the issue about access and taking control of our digital library, embedding information literacy and digital capabilities into our training and, most importantly, understanding the online user behaviour in order to ensure that we create rich online environments. There is a lot to do in order to be future ready but these are issues that have not gone away in all my years as a librarian. Of utmost importance is that we recognise the uniqueness of our hidden collections and re-consider our expenditure on these collections. These collections are and will be 'our brand'. As librarians, we need to accept our new roles – as curators, content creators and as educators and begin to take control of our relationships: our relationships with the teaching staff and the decision-makers at our institutions –so that we can embed information and digital literacies as core skills in the curriculum and so that we can develop collaboratively open education resources to enhance the teaching and learning and to promote the library and its collections to a wider audience. And, we must take control of our relationship with publishers so that we can manage our digital space more effectively and efficiently – as we do with our physical spaces.

Finally, we need to be prepared to meet the student who may not have had experience of using libraries. So many libraries in the UK are closing and the first thing that is cut in schools is the library. In the US the phenomenon of the 'bookless' library is growing. It is important to perhaps think about widening academic library participation in schools in order to better prepare students or higher education. This could be at the time when sixth formers need additional resources whilst working on their extended research projects. Perhaps these are some of the ways in which we can look beyond the horizon and into the future.

NOTES

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[10] Ibid.