21st-century Scholarship and Wikipedia

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Amber Thomas explores the ways in which emerging research practices and Wikipedia illustrate the changing boundaries of academic work.

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Wikipedia, the world's fifth most-used Web site [1], is a good illustration of the growing credibility of online resources. In his article in *Ariadne* earlier this year, "Wikipedia: Reflections on Use and Academic Acceptance" [2], Brian Whalley described the debates around accuracy and review, in the context of geology. He concluded that 'If Wikipedia is the first port of call, as it already seems to be, for information requirement traffic, then there is a commitment to build on Open Educational Resources (OERs) of various kinds and improve their quality.' In a similar approach to the Geological Society event that Whalley describes, Sarah Fahmy of JISC worked with Wikimedia and the British

Library on a World War One (WWI) Editathon [3]. There is a rich discourse about the way that academics relate to Wikipedia.

The EduWiki Conference in September 2012 [4] organised by Martin Poulter, brought together educators and Wikipedia authors to explore the ways that we can develop Wikipedia contribution and use. The relationship between OERs, open access, open academic practices and Wikipedia were very strong in the discussions, alongside issues surrounding digital literacy as well as citation and referencing practices. Wikipedia has made it very clear that as a reference work it should not be quoted as a primary source within academic work [5].

I presented on 21st-century Scholarship and the role of Wikipedia. I find myself increasingly using the word ‘scholarship’ to encompass academic practice at its best, whether in teaching, research or public engagement. In this article I will focus on four key trends that link scholarship and Wikipedia. The full slidedeck and poster are also available [6].

Scholarship Is Evolving

There are growing trends in the way that researchers work. They are not mainstream but I contend that these are key directions for scholarship, and they are directions that information professionals need to understand.

Figure 1: Four directions in which scholarship is evolving

Trend One: The Wiki Way aka Perpetual Beta

A common phrase in Web software development is 'perpetual beta'. Whereas alpha means the polished product, beta means the step before, when there is still the possibility of change. Smartphone users will be familiar with the way in which apps often need updating for the latest functionality and fixes ('patches'). This is more commonplace now than when we mostly used desktop software rather than 'apps': partly because connectivity and account management make it possible to make rapid updates easier, and partly because software developers are more comfortable working on a continual release model. Perpetual beta is the byword for acknowledging that the product will continue to develop, a fact they present as a virtue rather than a fault.

‘Wiki’ famously comes from a Maori word 'wiki', meaning a particular type of fast bus. It has come to mean a way of working on the Web that is highly collaborative, where people can contribute and edit, and there is wiki software designed for this purpose. The 'wiki way' is more the philosophy of

collaborative Web publishing, or even of working more generally, where working is fairly fast, it is done in public, feedback is invited, and thus the whole process is both more social and more visible.

I think both of these trends are manifested in emerging scholarly practices.

Scholarly method has always recognised that the process by which knowledge is constructed is as important as the way that it is presented. Whether researchers work in the hard sciences, the social sciences, the humanities or the arts, transparency of methodology is a key element of scholarly communication. The digital age provides ways of sharing that method more explicitly. This is a deepening of scholarly principles. The concept of reproducibility of research results [7] drives the sharing of data and experiment design, behind the Open Notebooks model [8] and platforms such as MyExperiment [9]. Working in the open can include blogging book chapters as they are written [10], or writing a doctoral thesis online [11]. There are platforms designed to support open collaborative writing, such as booktype [12].

When researchers do their work in the open, they can develop a profile, increase the impact of their work, they can reach the like-minded, attract the respect of peers, and most importantly, do what they do better. Services like Google Scholar, figshare, academia.edu and peerJ are starting to obtain traction in representing the researcher's 'digital footprint', now aided by the development of individual Researcher Identifiers such as ORCID.

Trend Two: Many Eyes

This is a principle from within the open source software movement [13]. As described by Linus Torveld, 'given enough eyeballs, all bugs are shallow' [14]; … with many eyes 'almost every problem will be characterized quickly and the fix will be obvious to someone.' This is because people working together can bring more accuracy.

In a very immediate way I have often benefited from this in my own work. When I blogged an extract of my OER Rapid Innovation Call for Proposals [15], it sent a pingback to the CUNY Academic Commons in a Box [16] Project. The project leader spotted that I had mistakenly credited SUNY instead of CUNY and requested a correction. That would not have happened had the text remained within the PDF of the Call Document. The sheer 'linkiness' of blogs gives a rich opportunity for content owners to improve each other's work. This example also highlights the vulnerabilities of openness. Had I not blogged my error, no one would have detected it, including me. The many eyes approach represents a trade-off between personal control and collective accuracy.

Research has long recognised the value of review, both of the research process and of its outputs. The digital era is forcing questions of how best research can be peer-reviewed: at which stage of the process, the relationship of peer review to publication, the different ways that this can be funded and managed.

Within this rethink are key questions about the purpose of scholarly publication. Is it mainly to facilitate knowledge exchange between researchers within the same field? Or across fields? Or outside research institutions?

The notion of extended participation in research is also one of the drivers behind in opening up scholarly activities to participation from the public. Projects like Transcribe Bentham [17], Old Weather [18], iSpot [19] and the many projects from Galaxy Zoo [20] utilise the involvement of non-academics to collect and transform data. This approach is not without controversy, as described by Andrew Flinn

in his article on “An Attack on Professionalism and Scholarship? Democratising Archives and the Production of Knowledge” [21]. These mass participation approaches use the Web to achieve scale and depth in ways that would have been incredibly hard to do before the digital age. They make the boundaries of scholarship more porous.

Trend Three: Beyond Dewey

As readers of *Ariadne* will know, the Dewey Decimal System was for organising books on a shelf: one book, one shelf. The digital age is about multiple views onto the same content. Information professionals have been adjusting their methods to this new reality for decades now: this is not a new trend. I would argue that Wikipedia is a good illustration of the tipping point in the public consciousness of the interconnectedness of information. We are becoming used to text being clickable: without knowing about concepts of “the semantic web”, people understand that to click a name, a place, a thing, an idea, is to visit it. Wikipedia represents this perfectly. I am not advocating giving up on classification and categorisation, but I am saying that at the presentation layer, information needs to be aggregated and represented in more fluid ways than the print paradigm of Dewey’s time. At the extremes there are models of bottom-up folksonomical approaches [22], but common mainstream practices on the Web already reflect this shift: we are already post-Dewey.

This is reflected in how we navigate online content. JISC’s Digital Information Seeker report [23] examined how people read online - researchers ‘bounce’ and ‘whirl’: they explore, jump, browse, they click about. This multidimensional content structure reflects more authentically the complexity of knowledge. New pedagogies are being explored to develop the way that can be supported by educators [24]. This information landscape is rich and deep and calls for improved digital literacies such as the approaches supported by JISC’s programmes [25].

Developing our digital literacy means adjusting our information handling practices to an abundance of information. We cannot assume something is true just because it is online: we need to apply our information literacy, cultural frameworks and critical thinking to decide for ourselves. The sheer clickability or ‘linkiness’ of the Web can make it feel like exploring new territory.

My university library was wasted on me as an undergraduate. I read what I had to read and some of what I wanted to read too. I do not recall ever reading a journal. Even as a very engaged and conscientious student of philosophy, journals were intimidating and alien. Had I been studying in 2012, I would have been far more likely to encounter articles online, either through searching within library holdings and/or finding open access versions online. I would have explored more. The possibilities of island hopping, of moving diagonally and serendipitously between information are far greater than they ever have been.

Trend Four: Knowledge is Networked

Wikipedia is an excellent illustration of how this multidimensional landscape works. It is full of rich linking. Some analysis of Wikipedia is particularly interesting in how it surfaces those patterns. Simon Raper [26] and Tony Hirst [27] have both graphed the links between pages about philosophy and philosophers. Visualising those links shows how the work of thinkers becomes a node in a network. I like to imagine that for modern scholars we will see the equivalent of Rock Family Trees [28] emerging: a deepening live graph of each academic’s role in the network, each node in what Minksy termed the Society of Mind [29]. There are such rich opportunities in the digital humanities, where text becomes structured data, and structured data becomes images, helping us visualise the network, the connections between ideas.

I mentioned in the opening section of this article that there is consensus between Wikipedia and academics that Wikipedia should not be cited as a primary source in academic work. But thinking of my own digital practices, I often use a Wikipedia entry as an identifier for a concept. When I want to cite a person or a theory, my first point of call is often Wikipedia. I see it as a set of identifiers in a linked data way. My reference for this paragraph is a case in point. I went to get the definitive definition from linkedata.org and it cited Wikipedia's definition within its own:

> "Linked Data is about using the Web to connect related data that wasn't previously linked, or using the Web to lower the barriers to linking data currently linked using other methods. More specifically, Wikipedia defines Linked Data as "a term used to describe a recommended best practice for exposing, sharing, and connecting pieces of data, information, and knowledge on the Semantic Web using URIs and RDF." http://linkeddata.org/

However I am not so much talking about linked data as about utilising the inherent linkiness of the Web. Imagine blog-style trackbacks for all links, improved intelligence on inbound and outbound links, being able to see how one piece of content is linked to the Web. The technology for this may come not from the traditional information sciences but from the new practice of 'digital marketing'. Marketers are rushing to understand the way that they can find audiences, detect semantic content (eg positive and negative responses), analyse the networks between people, understand patterns of social influence, predict buying trends and track the spread of information. In short, they are trying to understand how networks work.

Public Scholarship

It is far more fashionable to question public participation in research than to embrace it. Andrew Keen's "Cult of the Amateur" [30] is still widely referred to. In this work Keen identified the Internet, and in particular Web 2.0 practices, as running counter to the process of professionally produced knowledge. He questions the reliability of 'the wisdom of the crowd' and fears that the expansion of 'unfiltered knowledge' does not bode well for the future.

I have always found that a rather misanthropic view. Our social structures of validating knowledge have always changed over time, whether within apprenticeship, craftsmanship, the "professions" such as law and medicine, or the arts: shifts in the way we organise our knowledge are part of the process of knowledge construction and I see no reason for this era to be the first one in history that fails to adjust. I am more optimistic, particularly given that that we have yet to see the effects on our popular culture of mass Higher Education within the UK.

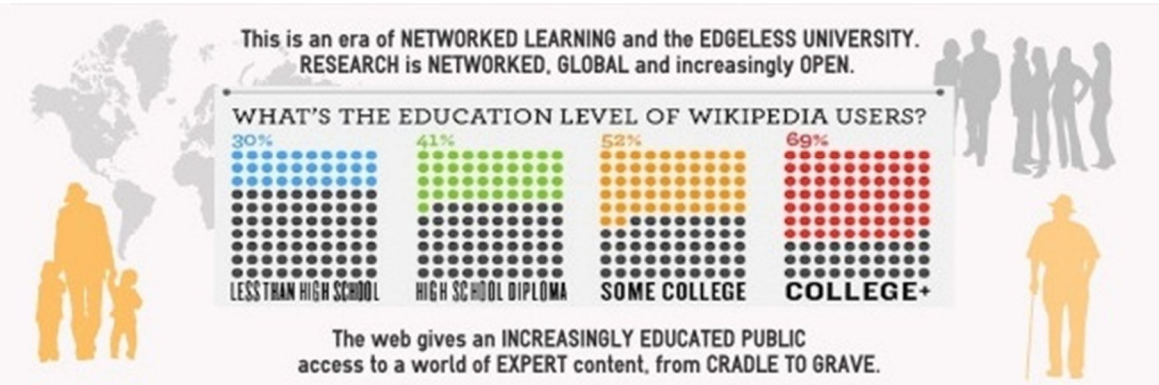

Figure 2: Public scholarship and the education level of Wikipedia users

Melvyn Bragg recently described the idea of a mass intelligentsia [31] which is a positive perspective on the emerging effects of mass Higher Education. Bragg hosts BBC Radio 4's *In Our Time* which surfaces a long tail of academic knowledge in an engaging way. 'High-brow' broadcasting is no longer constrained to radio either. The relationship which the UK Open University developed with the BBC has moved well beyond filming tweedy maths professors at 2am, and towards cross-platform projects like the Blue Planet which receives huge viewing figures. I see reasons for optimism there.

Beyond the UK, the Commonwealth of Learning has been highlighting the huge gap between demand and supply of higher-level learning [32], pointing to a potentially huge growth in university-level courses globally. Rising to meet this demand is a new breed of education provision, of experimentation with mass online courses, different models of accreditation and partnerships between providers collectively known as 'open education'. The means by which this gap might be addressed is the subject of fierce and heartfelt debate which is not the subject of this article. But it shows a demand. And I hope that if this demand is met, we *will* have an increasingly educated *global* public.

Online academic content, in the form of open access research, open educational resources and initiatives around public engagement [33], all have their part to play in nurturing this rich information landscape.

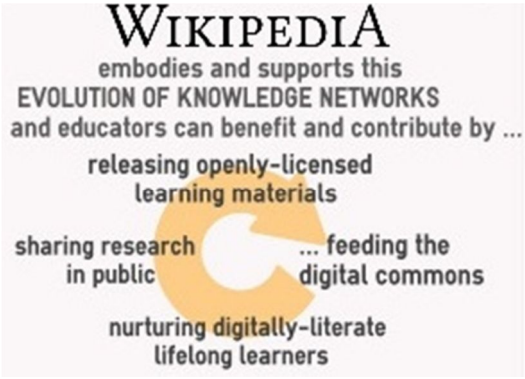

Figure 3: How educators can contribute and benefit

Universities can benefit from Wikipedia engagement. Brian Kelly of UKOLN has been collating data on the importance of Wikipedia as a referrer to academic work [34]. Wikipedia is itself a rich source of data for scholarship, particularly in the digital humanities. As I described above, the potential to mine the relationships between people, places and ideas is fascinating, and layered above that is Wikipedia as a visible collective construction of knowledge itself, with all the editing history available to view. Try looking up a controversial topic such as "MMR" and examining the chat and editing history, and you can see knowledge construction at work. The recent announcement that Wikipedia is making anonymised search logs available [35] opens up a wealth of possibilities for academics: what are the current points of intersecting interest across cultures, across languages? Can we visualise what people look for and what they find?

Wikipedia is therefore not just a reference source but also a living social project with much to interest researchers. The partnership between education and Wikipedia is potentially very powerful. Wikimedia UK is keen to work with universities to engage more academics through its Education Strategy [36].

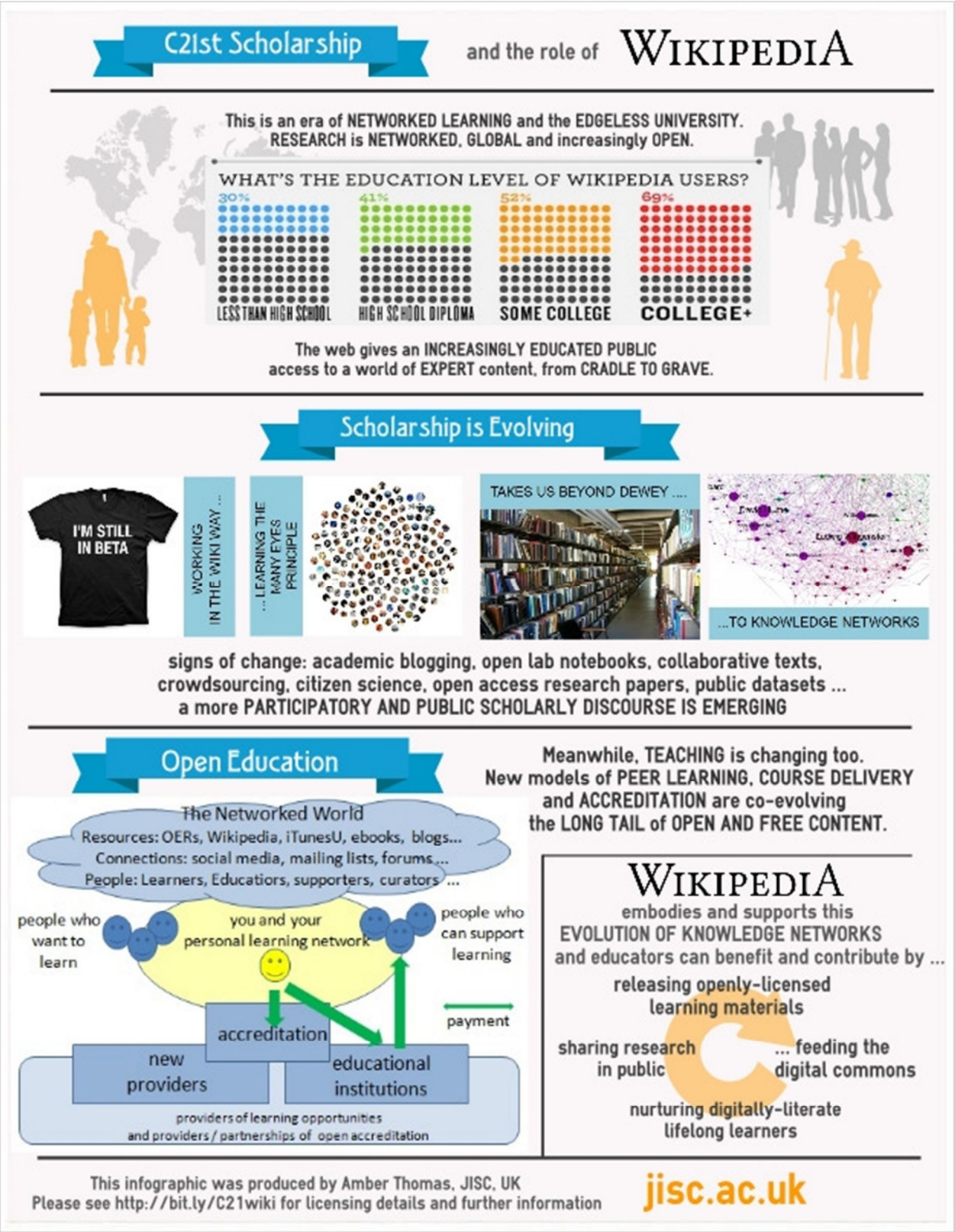

Figure 4: The whole picture

Conclusion

I have described the ways that Wikipedia is reflective of the story of knowledge in the digital age. In some areas of scholarship these new ways of working have been embraced, particularly in the e-

sciences, but there is still so much untapped potential. Wikipedia is an illustration of the way that academic work needs to change to benefit from a more educated public, a more networked world, in an age of information abundance. 21st-century scholars should be working with it, not against it.

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Amber Thomas was a JISC programme manager until December 2012 and is now working at the University of Warwick managing the Academic Technology Support Service. At JISC she led work on open educational resources and repositories such as Jorum. She oversaw JISC's projects on the technical and IPR issues which surround putting resources online. Amber not only has experience and expertise of Higher Education but also of Further Education with experience gained with Becta as content officer of the National Grid for Learning and the Ferl Online Service that provided support on information and learning technology (ILT) in Further Education.

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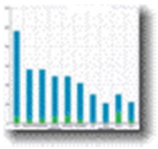

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