

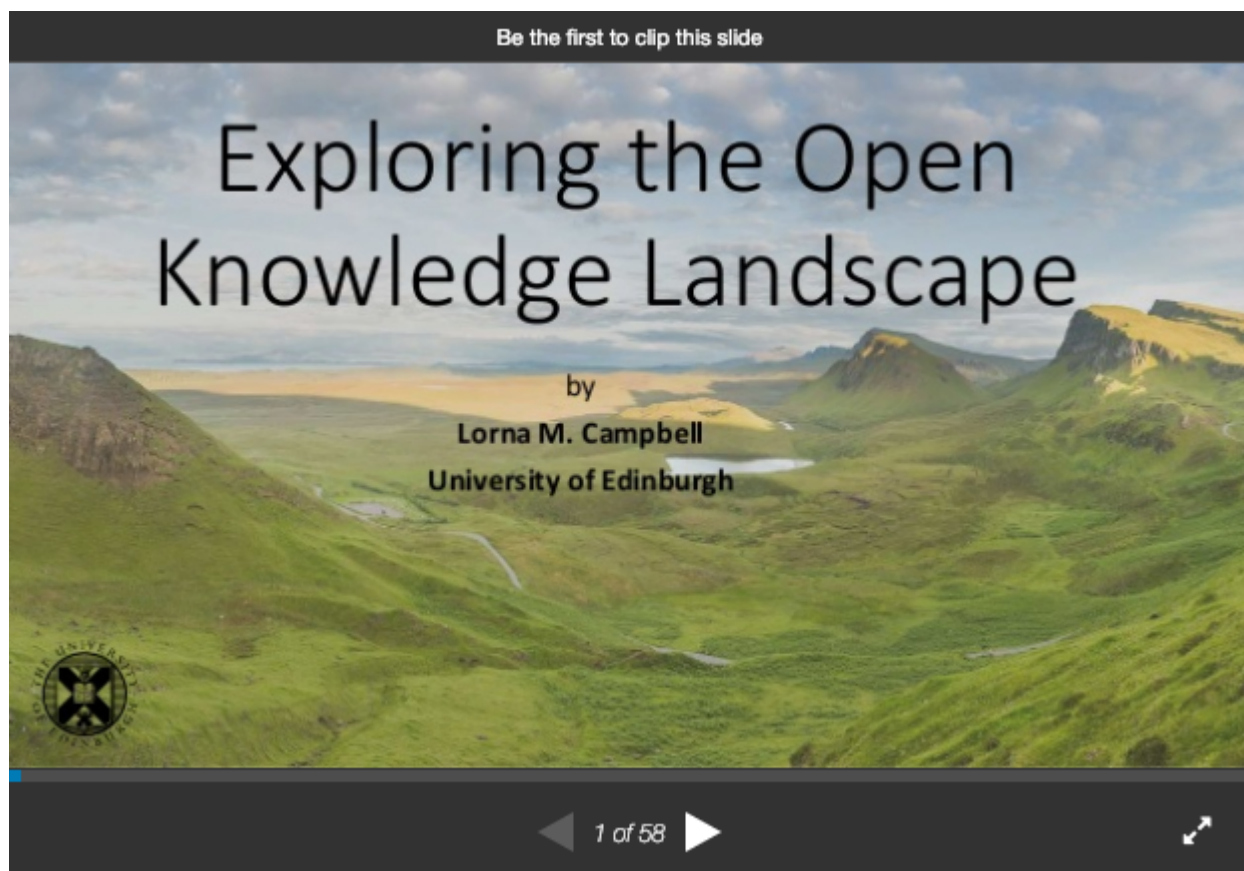
Exploring the Open Knowledge Landscape

Lorna M. Campbell

Editor's Note

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[Exploring the Open Knowledge Landscape](#) from [Lorna Campbell](#)

I'm not a programmer. I'm not a developer. And I don't contribute directly to the creation of free and open source software. I originally started out as an Archaeologist but I now work in the domain of Open Knowledge and more

specifically open education. I currently work for the Open Education Resources Service within the Information Services Group at the University of Edinburgh, I'm a Board member of both the Association for Learning Technology and Wikimedia UK, and a member of Open Knowledge International's Open Education Working Group. All these organisations are part of the Open Knowledge landscape and what I want to do today is provide a broad overview of some of the different domains, communities and cultures that make up this landscape including open education, open data, open textbooks and Open Access Scholarly works. And I also want to explore the boundaries that crisscross this landscape and demarcate these open spaces, and ask who is included, who is excluded, and what we can do to make our communities more diverse and inclusive.

In the words of the late, great Maryam Mirzakhani, former professor of mathematics at Stanford University and the first female winner of the Fields Medal, who sadly passed away last year.

"I like crossing the imaginary boundaries people set up between different fields—it's very refreshing. There are lots of tools, and you don't know which one would work. It's about being optimistic and trying to connect things."

So that's what I want to do today, to look at how we can cross the imaginary boundaries of the Open Knowledge landscape and connect our different open communities.

Of course the open landscape will look very different to each and every one of us and the view we see will depend very much on our personal perspective and the privilege of our vantage point. These are some of the domains and communities that populate the Open Knowledge landscape as I see it.

- Open licenses
- Open educational resources
- Open education policy and practice
- Open textbooks
- Open badges
- Open online courses
- MOOCs (a very contested open space.)
- Open data
- Open science
- Open Access scholarly works
- Open source software
- Open standards
- Open government
- Open GLAM

I'm not going to attempt to cover all these areas, as we'd be here until next week, but I do want to explore some of the areas that I'm most familiar with and look at how we can all benefit from crossing the boundaries and building connections between these domains.

Open Education and OER

So let's start off with open education and OER.

The principles of open education were first outlined in the 2007 Cape Town Declaration, which laid the foundations of the "emerging open education movement" and advocated for the development of open education policy to ensure that taxpayer-funded educational resources are available under open license. The Cape Town Declaration is still an

influential document and it was updated last year on its 10th anniversary as Capetown +10 and I can highly recommend having a look at this if you want a broad overview of the principles of open education.

There is no one hard and fast definition of open education but one I like is from the not for profit organization OER Commons...

"The worldwide OER movement is rooted in the human right to access high-quality education. The Open Education Movement is not just about cost savings and easy access to openly licensed content; it's about participation and co-creation."

Though Open Education can encompass many different things, open educational resources or OER are central to any understanding of this domain.

UNESCO define open educational resources as:

"teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions."

It's useful to note that this definition accommodates a wide range of different resource types and it's notable that the term OER is interpreted very differently in different communities. In the US currently, OER tends to equate to open textbooks, and I'll go on and say why shortly, while in the UK we tend to have a much broader understanding of OER that encompasses a wide range of teaching, learning and cultural heritage resources.

The reason I chose this particular definition is that UNESCO is one of a number of organisations that actively supports the global adoption of OER. In 2012, five years after the Cape Town Declaration, UNESCO released the Paris OER Declaration which encourages governments and authorities to open license educational materials produced with public funds in order to realize substantial benefits for their citizens and maximize the impact of investment. And last year UNESCO brought together 111 member states for the 2nd OER World Congress in Slovenia, the main output of which was the UNESCO Ljubljana OER Action Plan. Central to the OER Action plan is the acknowledgement of the role that OER can play in achieving United Nations [Sustainable Development Goal 4](#) and support quality education that is equitable, inclusive, open and participatory.

In his summing up at the end of the congress UNESCO Assistant Director for Education Qian Tang said

"to meet the education challenges, we can't use the traditional way. In remote and developing areas, particularly for girls and women, OER are a crucial, crucial means to reach SDGs. OER are the key."

One of the key characteristics of open educational resources is that they are either in the public domain or they are released under an open licence and generally that means a Creative Commons licence.

However not all Creative Commons licences are equal and only resources that are licensed for adaptation and reuse can really be considered as OER. At the recent OER World Congress, Creative Commons CEO Ryan Merkley emphasized that free is not the most important thing about OER, it's the permission to modify and adapt resources that is most important, because that is what allows us to adapt educational resources to allow us to meet the specific and diverse needs of our learners.

At the University of Edinburgh we believe that open educational resources are strongly in line with our institutional mission to provide the highest quality learning and teaching environment for the greater wellbeing of our students, and to make a significant, sustainable and socially responsible contribution to Scotland, the UK and the world.

We have a vision for OER that builds on our world-class education and research collections, traditions of the Scottish Enlightenment and the university's civic mission. And this vision is backed up by an OER Policy, which encourages staff and students to use, create and publish OERs to enhance the quality of the student experience.

Open.Ed is our OER portal where you can access open educational resources produced by staff and students across the university, including teaching materials, video lectures, film content, games, 3 models and much more. Rather than investing in a proprietary repository, Open.Ed is supported by WordPress and we're currently in the process of implementing search and aggregation functionality based on the Solvonauts open source OER search engine developed by pgogy.

Open Textbooks

I mentioned earlier that the prevalent form of OER in North America is open textbooks. The reason being that North American education systems tend to be centred heavily around single use textbooks. According to SPARC, the Scholarly Publishing and Academic Resources Coalition, the price of textbooks has increased at more than three times the rate of inflation for decades, resulting in college students face steep price tags of up \$200 per book. These costs can be a considerable barrier in terms of access to education and also result in schools and colleges using books that are years out of date because they are too expensive to replace. SPARC is one of a number of organisations that campaigns for the adoption of open textbooks in the US, and they have recently been instrumental in persuading U.S. Congress to fund a [\\$5 million open textbook grant program](#).

Although we don't rely quite so heavily on single course textbooks here in the UK, textbook costs can still be significant. The UK OpenTextbooks project is a partnership between the OER Hub at the Open University, OpenStax and The Open Textbook Network which aims to explore the viability of introducing open textbooks in UK higher education.

While open textbooks offer many benefits when used as is, including cost savings and access to affordable high quality learning materials, the benefits of open textbooks increase significantly when you combine them with open source software. One initiative that is doing just that is BC Campus in Canada. In 2012 BC Campus received a \$1m grant from the British Columbia government to provide free and open textbooks for the top 40 course subject areas in post secondary education. The project collected existing open textbooks from OpenStax and the Open Textbooks Network, and adopted PressBooks, the open source book content management system, as a faculty friendly authoring platform for new open books. Because of the open extensible nature of the software, BC Campus have been able to add new features to PressBooks, such as annotation and new import and export routines and these are contributed back to the community as open source code. In the words of BC Campus' Clint Lalonde:

"PressBooks is easy for most faculty to use because many are familiar with WordPress. Faculty feel empowered and have the skills needed to adapt open textbooks to fit their specific learning needs. Faculty make their textbook reflect their pedagogy instead of the reverse."

MOOCs

Moving on now to MOOCs....

MOOCs, or Massive Open Online Courses, occupy a somewhat contested space in the Open Knowledge landscape. The term was originally coined in 2008 to describe a number of online courses, characterised by social connectivist and constructivist pedagogies, being run by the Universities of Athabasca and Prince Edward Island in Canada. These innovative courses focused on knowledge creation and generation and encourage learners to play a central role in shaping their learning experiences. From 2010 onwards however a number of primarily venture-capital funded commercial MOOC providers, including Udacity, EdX, Coursera and FutureLearn, entered the market with promises to disrupt education. The launch of these companies was accompanied by a huge amount of hype with Sebastian Thrun, founder of Udacity predicting that in 50 years time there would be only ten higher education institutions in the world, and of course, Udacity had a good chance of being one of them. Udacity now focuses primarily on vocational courses rather than the Higher Education sector.

Although MOOCs did not disrupt Higher Education, they did fill an interesting niche in the education market, and I use that term advisedly in this instance, and commercial MOOC providers are still thriving. My problem with MOOCs is that they are not open in any real sense of the word. The word “open” in MOOC simply means that anyone can join a course free of charge, regardless of qualifications. The platforms themselves are proprietary, and even if course content is open licensed it is often difficult to extricate from the platform. Most MOOCs are free as in beer rather than free as in speech and even this is increasingly debatable as many now charge for premium features such as certification and continued access to course materials. Of course one solution to this is to ensure all MOOC content is also available off these commercial platforms and available under open licence, and that’s the road we have gone down at Edinburgh. The University runs MOOCs on FutureLearn, Coursera and EdX platforms and has made a considerable investment in producing high quality content for use in these courses. In order to ensure this content is accessible and reusable for both our own students and colleagues and others outwith the University we make sure it can be downloaded under open license from our multi media asset management system, Media Hopper Create.

The original social constructionist MOOCs haven’t gone away though, and there are a wide range of creative and innovative online courses running all over the world now which truly embody openness and which are often supported by free and open source software. One nice example is 23 Things for Digital Knowledge, an award winning, open online course run by my colleague Charlie Farley at the University of Edinburgh. 23 Things is designed to encourage digital literacy by exposing learners to a wide range of digital tools for personal and professional development. The course runs on WordPress, all the content and materials are Creative Commons licensed and the University actively encourages others to take and adapt the course. Another amazing example is DS106 an anarchic digital storytelling course from the University of Mary Washington which has been running since 2010. The instigator of ds106, Jim Groom, is also the founder of Reclaim Hosting, a company that builds on the principles of the open web, and which provides teachers, learners and institutions with an easy way to own and control their own web domains and host open source applications. And I think we’ve all seen plenty of evidence recently as to why it’s so important to have the ability to control our own web domains and the data that our presence on the web generates.

Open Access Scholarly Works

Open Access Scholarly Works clearly occupy an important place in the Open Knowledge landscape. Since the publication of the 2012 Finch report on Expanding Access to Published Research Findings, and Research Councils UK’s, policy on Open Access, universities have been required to make the outputs of their publicly funded research freely and openly available through open access journals, repositories and other channels.

Free and open access to the outputs of publicly funded research provides important social and economic benefits as well as being in line with the Government’s commitment to transparency and open data, and contributing to the global open movement. In addition to making research outputs freely accessible to all, Open Access allows research to be disseminated quickly and widely, the research process to operate more efficiently, and has the potential to increase use and understanding of research by business, government, charities and the wider public.

However it is not always easy for those outwith academia to know how to access these outputs, even though they are freely and openly available. And within academia there is something of a divide between Open Access scholarly works and Open Educational Resources with the former tending to be managed by the Library within dedicated Open Access repositories, while the latter, if they are managed at all, tend to be dealt with on an ad hoc basis by learning technology services. As a result of the Research Council mandates, a whole repository infrastructure has been developed to facilitate the management and dissemination of Open Access scholarly works, while OER have often been somewhat neglected in comparison. A few initiatives have sought to accommodate scholarly works and teaching and learning resources in the same repository, but these have not been particularly successful as the resources themselves and the work flows they are part of are very different. This is unfortunate as Open Access scholarly works can clearly be of huge benefit to teaching and learning, and at the same time, OER can be harnessed to promote the outputs of open research.

One initiative at the University of Edinburgh that uses OER to help disseminate Open Access research outputs beyond the Academy, and to foster technology transfer and innovation, is Innovating with Open Knowledge. This project has created a series of open licensed video interviews, case studies and learning resources aimed at creative individuals, private researchers, entrepreneurs and small to medium enterprises to provide guidance on how to find and access the open outputs of Higher Education. The resources focus on developing digital and data literacy skills and search strategies and feature case study interviews with creative individuals, entrepreneurs and experts, engaging with the University of Edinburgh's world class research outputs. Among the case studies are a series of interviews about finding and using Open Source Software with Scott Wilson of the independent, non-advocacy service OSS-Watch.

Open Data

Open data can be defined as data and content that can be freely used, modified, and shared by anyone for any purpose.

Although there is no UK policy that mandates the release of open research data, there is a Concordat on Open Research Data, which was originally published by HEFCE, Research Council's UK, Universities UK and Wellcome in 2016. The Concordat recognises that research data should, wherever possible, be made openly available for use by others in a manner consistent with relevant legal, ethical, disciplinary and regulatory frameworks and norms, and with due regard to the cost involved.

In a parallel development, the UK Government has also made considerable efforts to open up its data for people to re-use through data.gov.uk, in the belief open government data can help governments be more transparent, and support business, academics and the third sector. This commitment is supported by the Open Government Partnership, an international initiative launched in 2011 that aims to help more governments become more transparent, more accountable, and more responsive to their own citizens, with the ultimate goal of improving the quality of governance, as well as the quality of services that citizens receive.

Open data can also make a significant contribution to social initiatives and humanitarian projects. One such example is the Humanitarian Open Street Map Team, who undertake a wide range of mapping projects to support disaster relief, socio-economic development, and geographic information for humanitarian aid. For example in 2010 when Haiti was hit by a devastating earthquake, the Open Street Map Community immediately mobilized; within 48 hours, high resolution post-earthquake imagery was made available, and in the first month following the disaster 600 people contributed to Haiti's open street maps. Similarly, when Sri Lanka suffered from severe flooding in 2016, the governments' Disaster Management Centre turned to the Humanitarian Open Street Map Team to urgently start tracing detailed building and housing unit information.

Although open data, open access, and open education have all made significant progress in recent years, there has been a tendency for these domains to progress in parallel with little sign of convergence and as a result there is a tendency to end up with "open silos". In the UK, research mandates and concordats may have had a positive impact on open access and open research data, however the connection has yet to be made to open education. While the benefits of open data are widely recognised in relation to scientific and scholarly research, open data also has considerable value in the context of teaching and learning. Many governments, non-governmental organisations and research centres are already producing large volumes of open data sets that have the potential to be used as open educational resources. Scenario based learning involving messy, real world data sets can help students to develop critical data literacy and analytical skills. Using open data introduces an invaluable element of realism and complexity as the data is flawed and inconsistent. Students come up against challenges that it would be difficult to reproduce artificially and, as a result, they learn to deal with the kind of problems they will encounter in the real world. And perhaps more importantly, working with real world open data from real governments, communities and research projects, doesn't just help students to develop data literacy skills, it also helps to develop citizenship, social responsibility and community engagement.

In an influential report by the [Open Knowledge Open Education Working Group](#), Javiera Atenas and Leo Havemann noted that

Educators who make use of Open Data in teaching and learning encourage students to think as researchers, as journalists, as scientists, and as policy makers and activists. They also provide a meaningful context for gaining experience in research workflows and processes, as well as learning good practices in data management, analysis and reporting.

However in a presentation at the Open Education Global conference in Delft just yesterday, Leo also reminded us that open data *alone* does not promote social justice. Quoting Johnston, Leo noted that unless people know how to access and use the data effectively, they can become mere objects of study, marginalized and excluded from participating in decisions about their own society.

Wikipedia

Of course no map of the Open Knowledge domain would be complete without Wikipedia and its associated projects including Wiki Data, Wikimedia Commons, Wiki Source etc.

Wikipedia itself is of course built on OSS, with the encyclopedia, Wikimedia Commons and Wiktionary all being supported by MediaWiki open-source wiki software. In addition, over 1000 automated and semi-automated [bots](#) and other tools have been developed to assist with Wikimedia editing. There are also fun tools such as Histropedia which uses the free Histropedia JS software and Wikidata to generate dynamic timelines of everything.

Here in the UK we have our own Wikimedia chapter, Wikimedia UK, which works in partnership with organisations from the cultural and education sectors and beyond in order to unlock content, remove barriers to knowledge, develop new ways of engaging with the public and enable learners to benefit from the educational potential of the Wikimedia projects. Wikimedia UK also supports a number of Wikimedians in Residence who work with a range of education and public heritage organisations throughout the country. In Scotland we have Wikimedians in Residence at the University of Edinburgh, the Scottish Library and Information Council, and a Gaelic Wikimedian at the National Library of Scotland. A new Wikimedia Scotland Coordinator, Sara Thomas, has also just been appointed and in Wales there is a National Wikimedian, Jason Evans, based at the National Library of Wales.

At the University of Edinburgh we believe that contributing to the global pool of Open Knowledge through Wikimedia is squarely in line with our institutional mission; the creation, dissemination and curation of knowledge, and we also believe that Wikipedia is a valuable learning tool to develop a wide range of digital and information literacy skills and capabilities at all levels across the curriculum. Our [Wikimedian in Residence](#), Ewan McAndrew, works to embed open knowledge in the curriculum, through skills training sessions, editathons, Wikipedia in the classroom initiatives and Wikidata projects, in order to increase the quantity and quality of open knowledge and enhance digital literacy.

There is no question that Wikipedia is an invaluable source of open knowledge, however it is not without bias. The Wikimedia Foundation's vision may be "a world in which every single human being can freely share in the sum of all knowledge", however the coverage of subject matter on Wikipedia is neither uniform nor balanced and many topics and areas are underrepresented, particularly those relating to women, people of colour and minority groups. For example, on English language Wikipedia only about 17% of biographical articles are about women, and the number of female editors is between 10 & 14%. Hopefully you don't need me to tell you why this lack of diversity and inclusivity is a serious problem. However it is a problem that is being addressed by the Foundation itself, by projects such as Wikiwomen in Red, and by Wikimedians and Wikimedians in Residence across the world.

At the University of Edinburgh an important aspect of our Wikimedian in Residence's work is to help improve the coverage and esteem of Wikipedia articles about women, and underrepresented minorities, in science, art, technology, and history, and to redress the gender imbalance of contributors by encouraging more women to become Wikimedia editors. And I'm very pleased to say that over the last year 65% of participants at our editathons were women. There

has also been phenomenal progress in Wales, and in 2016, Welsh Wikipedia became the biggest language Wikipedia in the world to achieve gender balance.

Inclusion, Exclusion and Structural Inequality

Wikipedia's well known problem with gender balance is a notable example of systemic bias. Wikimedia is an open community that anyone can contribute to in theory, however in reality there are many factors that prevent certain groups from contributing. In the case of women editors, former Wikimedia Foundation executive director Sue Gardner identified a range of systemic factors that discourage women from contributing to the encyclopedia, including lack of time, lack of self confidence, aversion to conflict, and the misogynistic atmosphere of the community. In addition, the very principles which underpin the encyclopedia discriminate against marginalised groups. Wikipedia is based on notability and citation, yet in fields where women and people of colour have been traditionally barred, or their contribution has been neglected or elided, it is much harder to find reputable citations that are critical for proving notability. Any article that is deemed to be inadequately cited runs the risk of rapid deletion for lack of notability, thus replicating real world power imbalances, privileges and inequalities.

Wikimedia is not the only open community that suffers from issues of systemic bias and structural inequality. In a paper on Open Initiatives for Decolonising the Curriculum, in the forthcoming book *Decolonising the University* edited by Gurinder K Bhramba, open source software developer Pat Lockley notes that universities with the highest percentages of black staff are those which spend the least – in many cases, nothing – on open access article processing charges. And he goes on to ask whether Open Access really is broadening and diversifying academia, or merely reinforcing the existing system.

When we look at MOOCs supported on commercial platforms, the situation is arguably worse. Far from democratizing higher education and reaching out to disadvantaged groups, numerous studies have shown that the majority of MOOC enrolments tend to be young, male, employed, and from the developed countries of the global north. Furthermore, the majority of MOOC students already have some kind of postgraduate qualification. An important survey undertaken in 2013 by the University of Pennsylvania of 24 courses offered by through Coursera found that 80% of the 34,000 students questioned already had a degree and 44% had also undertaken some form of post graduate education. The figures were even more stark outwith the US, with 80% of students from Brazil, China, India, Russia, and South Africa coming from the wealthiest and best educated 6% of the population. Furthermore, these students were much more likely to be male than female. Gayle Christensen, one of the authors of the report noted that MOOCs are failing to reach the students they had intended to empower and instead they are giving more to those who already have a lot.

Similarly, in its 2017 [survey](#) on open source software development practices and communities, Github reported huge gaps in representation and concluded that the gender imbalance in open source remains profound and that open source contributors don't yet reflect the broad audience of users. From a random sample of 5,500 respondents 95% were men; just 3% were women and 1% are non-binary.

And there are many other examples of similar structural inequalities in open spaces and communities. We all need to be aware of the fact that open does not necessarily mean accessible. Open spaces and communities are not without their hierarchies, their norms and power structures. And we need to look around our own open communities and ask ourselves who is included and who is excluded, who is present and who is absent, and we need to ask ourselves why. Because nine times out of ten, if certain groups of people are absent or excluded from spaces, communities or domains, it is not a result of preference, ability, or aptitude, it is a result of structural inequality, and in many cases it is the result of multiple intersecting inequalities. And if you're interested in how such inequalities have impacted the development of the computing industry in the UK, I can highly recommend this book by Marie Hicks *Programmed Inequality How Britain Discarded Women Technologists and Lost Its Edge In Computing*.

Far too often technology and technology communities replicate the structural inequalities that permeate our society. And I think we're all aware of the very pressing current debate about how algorithms encode both conscious and

unconscious bias.

So how do we change this? Well half the battle is recognising that there is a problem in the first place, taking steps to understand that problem, and then doing the hard work to effect change. And believe me, it is hard work, these things won't change over night, but they do have to change. Those of us who are already inside these open spaces and communities need to take positive action to make our communities, not just open, but accessible and inclusive. And to do that, to borrow a phrase from another group who campaigned for radical change and inclusion at the turn of the last century, the Suffragettes, we need Deeds not Words.

In the Guerilla Open Access Manifesto Aaron Shwartz said

"Those with access to these resources — students, librarians, scientists — you have been given a privilege. You get to feed at this banquet of knowledge while the rest of the world is locked out. But you need not — indeed, morally, you cannot — keep this privilege for yourselves. You have a duty to share it with the world."

The same is equally true of Open Knowledge and open communities. We have been given the privilege to participate, and we can not keep that privilege to ourselves. We need to identify the barriers that prevent some people from participating, and we need to do what we can to remove these systemic obstructions. And to me this is what openness is really about, the removal of systemic barriers and structural inequalities to enable everyone to participate equitably, and on their own terms. We have a duty to ensure that our own open communities really are just that, open to everyone, regardless of race and gender, because that's how we ensure that we really can cross the imaginary boundaries of the Open Knowledge landscape.

Chris Lamb began his keynote yesterday with three stories, and I want to end my keynote with a story too, one which I believe demonstrates why it's so important for all those of us who work in the broad domain of Open Knowledge to come together to break down the barriers that divide us.

This is Bassel Khartabil Safadi a Syrian open source software developer, open knowledge advocate, Wikipedia editor and project lead for Creative Commons Syria.

Bassel was also a contributor to the New Palmyra Project; a digital archaeology and open data initiative that aims to create a virtual reconstruction of the ancient city of Palmyra, large parts of which have been destroyed by ISIS during the Syrian civil war.

As a result of his open knowledge activities, Bassel Khartabil was detained by the Syrian government in 2012 and held in Adra Prison in Damascus for 3 years. In October 2015 his name was removed from the prison register and, despite calls from numerous human rights organisations, his whereabouts remained unknown.

In order to raise awareness of Bassel's disappearance a group of open practitioners came together to write the open e-book *The Cost of Freedom: A Collective Inquiry* which includes essays, poems, personal reflections and polemics from a wide range of international open knowledge and free culture advocates. My contribution to the book was a short piece called *The Open World* which touches on the personal risks, costs and benefits of openness.

Sadly in August last year news was released that Bassel had been executed by the Syrian regime in 2015. In order to honor his memory and to support projects in the spirit of his work, Creative Commons has established the Bassel Khartabil Memorial Fund which provides grants to advance collaboration, community building, and leadership development in the open communities of the Arab world. The fund also supports the digital preservation, sharing, and remix of creative works and historical artifacts.

Just a few weeks ago, at the Creative Commons summit in Toronto, the first Bassel Khartabil Free Culture Fellowship and Memorial Fund recipients were announced, and you can find out more about those recipients and their projects here <https://edtechbooks.org/-aYc>

Before he was executed, Bassel wrote from Adra prison

"Of my experience spending three years in jail so far for writing open source code (mainly) I can tell how much authoritarian regimes feel the danger of technology on their continuity, and they should be afraid of that. As code is much more than tools, it's education that opens youth minds and moves the nations forward. Who can stop that? No one.... As long as you people are out doing what you are doing, my soul is free. Jail is only a temporary physical limitation."

The fate of Bassel Khartabil is a sobering but inspiring reminder of why Open Knowledge is so powerful and so necessary and why we must all work together to achieve a more open, inclusive and equitable society.



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