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The Open Education Evidence Hub: A Collective Intelligence Tool for Evidence Based Policy

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Abstract

This paper considers a Collective Intelligence approach to collating the evidence needed to support policy in open education. A tool, called the OER Evidence Hub, provides an infrastructure for the OER community to collect examples and data of OER effectiveness and use and then supports the community and others such as policy makers with a community-generated knowledge base to help decision making. We describe the Evidence Hub concept and features, present figures on user engagement, and discuss the results of initial user testing. We also show through examples how content can be seeded into the OER Evidence Hub, and illustrate the way in which it has captured exemplars identified by a particular community, the OER Advocacy group. Finally we discuss general issues and future strategies for building effective Collective Intelligence platforms for Open Education and other purposes.

Introduction

In this paper we present work developed within a specific project (OLnet) which aims to support the Open Educational Resource (OER) Community. Our goal is to co-design the people, processes and platforms to support and enable more effective Collective Intelligence (CI) for the OER movement. We propose an approach which builds on the mechanisms already in place by which we share insights and experiences, but adds a layer to structure and index that knowledge sharing so that it is not locked in minds or documents. An important lesson from learning sciences is that sensemaking and learning occur through discourse: the sharing and critiquing of ideas in ways that both affirm and challenge. Central to this is the presence of potentially conflicting viewpoints. Our approach to CI therefore focuses on *scaffolding interpretive discourse and on alerting users to when there are both agreements and differences in opinion*. Therefore collective Intelligence for OER sustainability starts with capturing the hidden knowledge of the OER movement and leveraging it so that can be re-used and put in value. We build on the stance that this knowledge is usually hidden in the minds and thinking of OER users (learners and teachers), advocates, practitioners and funders, or it is distributed in many virtual or physical “places” and therefore difficult to retrieve. We therefore need better ways to capture such thinking and connect and scaffold it to develop the Collective Intelligence of the OER movement. CI then provides a suitable infrastructure to support the OER movement to tackle the many challenges it faces.

In this paper we present the way previous concepts have been articulated and developed into the Evidence Hub, a prototype tool to map the learners, researchers and practitioners' thinking, knowledge and evidence of OER effectiveness and make those visible and debatable, thus building what we termed Contested Collective Intelligence (De Liddo & Buckingham Shum 2010, De Liddo & al 2012) around OER. In section two we describe the main features and content types of the Evidence Hub, focusing on the description of key challenges and emerging OER themes. In section three we describe some facts on the EH history and some figures on user engagement. In section four we then discuss the results of initial user testing and how they have affected user interface design. Finally in section five we show how content can be seeded into the OER Evidence Hub, and capture exemplars of EH content identified by a particular community, the OER Advocacy group. We conclude by reflecting on issues and future strategies to inform the development of collective intelligence platforms for Open Education (section 6).

The Evidence Hub for Open Education

The Evidence Hub (EH) for Open Education has been developed within the Open Learning Network project (OLnet¹) and it aims to provide an environment to systematically interrogate the Open Education movement on what are the people, projects, organizations, key challenges, issues, solutions, claims and evidence that scaffold the movement. The Site is a space to collaboratively build an evidence hub that represents and maps the collective knowledge of the Open Education community. Ultimately the Evidence Hub seeks to provide researchers and practitioners in Open Education with a dynamic and living map of where the Open Education movement is and where it is heading. To do so the Evidence Hub provides OER scholars, researchers and practitioners with an environment where they can put the key entities 'on the map' – literally, through the provision of a range of different visualizations to:

- Explore and debate the key challenges for the Open Educational movement. The OER community can link these challenges to issues, claims, organisations and solutions they are concerned with. Moreover, key challenges can be promoted or demoted, so that community can express how important they consider each challenge to be.
- Add new projects and organizations to the OER network. Members of the OER community can add a description of their project, including geographical location and website and then use the location map and theme map view to explore other organizations.
- new issues and questions can be posted, explored and discussed,
- new solutions can be proposed to tackle the major challenges facing Open Education,
- relevant evidence and Web resources for the OER community can be shared to contribute to the evidence base of OER impact on teaching and learning,
- new claims of OER effectiveness can be made and investigated, that are informed by the OER

It is out of the scope of this paper to provide an exhaustive description of the whole EH features, nonetheless in the following we present some screenshots showing the different maps that the Evidence hub brings into the OER debate.

¹ For more information on the OLnet project please visit the OLnet website at www.olnet.org

Key Challenges for the OER movement

Twelve key challenges for the OER movement have been identified through analysis of the data gathered in the Evidence Hub and by conducting a consultation with leading OER researchers and OER advocates.

These key challenges form a good starting point for exploring the evidence in the Hub and aim to allow the community to link these challenges to issues, claims, organisations and solutions they may be tackling in their main OER research or practice. The Hub also allows the existing key challenges to be promoted or demoted, so that community can express how important they consider each challenge to be. The 12 key challenges as currently expressed in the EH are shown below. (More information on the process of consultation conducted to distil those challenges can be found at <http://www.olnet.org/node/639>.)

- ❓ Who and how to create new appropriate Assessment/Evaluation models and practices for OER?
- ❓ What are the costs and benefits of using OER in teaching?
- ❓ What can be done to improve OER Sustainability?
- ❓ How can we improve the value and impact of OER Research?
- ❓ What Technologies & Infrastructure are needed/in place to help the OER movement?
- ❓ What Institutional Policies are needed/in place to promote OER?
- ❓ What are the best ways to Promote and Advocate educational methods which use OERs?
- ❓ How do we create the right culture of teaching and learning to improve OER Adoption?
- ❓ What evidence is there of Use (and Re-Use) of OER?
- ❓ What are the issues surrounding Copyright and Licensing, and how can they be overcome?
- ❓ How do we ensure OER is of high Quality?
- ❓ How can we improve Access to OER?

Key Challenges for the OER movement.

Emerging OER themes

All the EH content (people, projects, organizations, key challenges, issues, solutions, claims and evidence) has been categorized by following a taxonomy of 18 OER themes. This categorisation results from an analysis of 125 Hewlett Grantee Reports. Four OLnet researchers² analysed the reports to extract key messages and identifying the main OER themes emerging during the analysis. The projects represent the major investment by The William and Flora Hewlett in the last 10 years, and therefore can be considered as reasonable sample data to capture the evolution of the interests and issues of the OER community in the last decade.

The final list of 18 themes is the result of a post-analysis effort, conducted by the OLnet researchers, to group the full list of themes into higher level categories.

The classification of content by OER themes allows users to explore the Evidence Hub by topic of interest (i.e. OER policy, reuse, access etc.) A list of the main themes can be found as tag cloud at ci.olnet.org in the EH home page (Fig. 1).

² We thank Dr. Panagiota Alevizou, Dr. Andreia Inamorato dos Santos, Dr. Elpida Markiyanni and Dr. Tina Wilson which conducted the content analysis of the Hewlett Grantee Reports.

Access Adoption of OER Community Building
Content Creation Copyright and Licensing
 Deeper Learning **Discoverability** Dissemination and Awareness
Networks and Sharing OER Research Ongoing support
Policy Reuse of OER Sustainability
Teaching and Learning Tools and Technologies
Training Use of OER

Figure 1: Main OER Themes

Each OER theme can then be explored. The “explore view” of a theme shows all the related Organization/Projects, key challenges, issues, solutions, claims and evidence. Moreover it shows the people following that OER theme and the Users’ comments to the theme page (Fig.2).

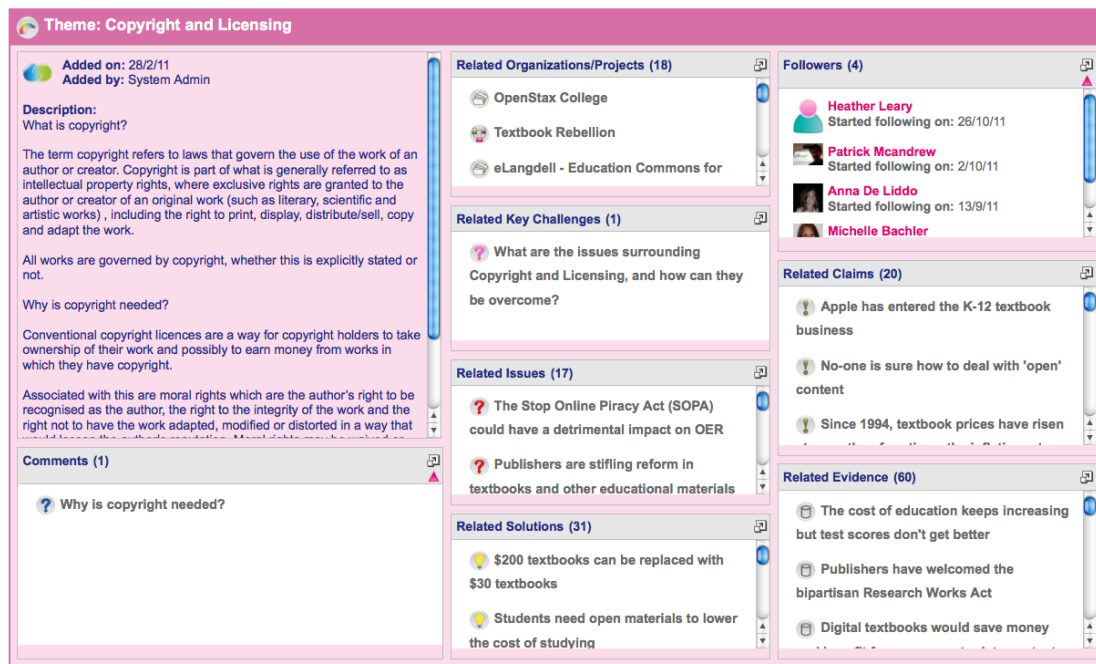


Figure 2. Explore view of “Copyright and Licencing” Theme

Some Facts and Figures

The Evidence Hub alpha version has been launched in April 2011 at the OER11 Hewlett Grantees meeting in Sausalito. In order to preserve quality of data entry the System was initially kept closed, so users could register and request approval before they could start contributing to the site. The system has been opened to the public at OpenEd11 in Utah. At that point, in a brief period of time, the number of EH users doubled.

The Evidence Hub at the moment has about 100 signed up users, amongst whom there are well known members of the OER community (user information is available via ci.o1net.org) and it received 3,054 visits from 1,053 unique visitors from 57 different countries (see Map overlay and Visitors overview maps below Fig.3).



Figure 3. Main Google Statistics on EH visits

Moreover, 299 OER projects and organizations have been added to the Evidence Hub; 129 research claims have been proposed, 79 OER issues and 89 proposed solutions have been connected.

A total of 323 Evidence and 553 Resources have been shared in the Evidence Hub to support both research claims and proposed solutions to specific OER issues. In total 1,472 user generated content elements have been added to the Evidence Hub.

Reflection on the Evidence Hub User Testing

We conducted a lab-based user interface evaluation with OLnet fellows and researchers to capture their use of, and interests in, the Evidence Hub and to gather usability feedback on the system. Feedback from the users shows that the EH is perceived as a “*relevant*”, “*organized*”, “*desirable*” and “*engaging*” system but at the same time sometimes “*sophisticated*” and “*complex*”. The main suggested improvements regard two aspects of the system: Resources and Summary views.

Users reported that there are a lot of OER open questions that are presented in the system, that are still not developed and they would like to see more evidence, more projects and organizations and more resources in the map. This feedback seems to suggest the importance of content seeding: more content needs to be seeded in the EH so that a critical mass of data is reached and can catalyse interest from the wider OER community.

At the same time though, users reckon that where information gets too much, they need assistance in grasping the bigger picture: what are the main issues and to what key challenges they relates to, what are the key resources to inform policy makers? What are the strongest arguments for Open Education?

Based on these usability feedback future improvements for the EH should move toward two main objectives: *facilitate and simplify content seeding and improving the user experience by creating summary views and better displays and filters on the content.*

A first attempt toward the second goal we developed Overview pages for each content type, which show the “most recent”, most connected” most voted” and “most popular themes” for each content type. Example Overview pages for Evidence (Fig. 4), Project and Organizations (Fig. 5) are shown below. Finally an overview page for users activities is shown in figure 6.

+ Add Evidence Search Evidence

My Items All

Overview | List View (323) | Themes Map View

Most Recent Evidence

- South Africa has invested heavily in OER
- The cost of education keeps increasing but test scores don't get better
- Encyclopedia of Life

[Explore all](#)

Most Connected Evidence

- Taking OER beyond the OER Community: Policy and Capacity (2010)
- JISC OER Impact Study (2011)
- A Cover to Cover Solution: How Open Textbooks are the Path to Textbook Affordability

[Explore all](#)

Most Voted on Evidence

- Open Educational Resource Components in Select Federal Grant Programs
- Sustaining OER at the University of Cape Town: Free, but not cheap
- Benefits and challenges of OER for higher education institutions.

[Explore all](#)

Most Popular Themes for Evidence

- Copyright and Licensing
- Adoption of OER
- Teaching and Learning

[Explore all](#)

Figure 4. OER Evidence Overview Page

+ Add Organization/Project Search Organizations/Projects

My Items All

Overview | List View (299) | Themes Map View | Geo Map View

Most Recent Organizations

- SoLAR: Society for Learning Analytics Research
- AACC (Anne Arundel Community College)
- Open Universiteit

[Explore all](#)

Most Connected Organizations

- The William and Flora Hewlett Foundation
- JISC (Joint Information Systems Committee)
- OCW Tecnológico de Monterrey

[Explore all](#)

Most Popular Theme for Organizations

Community Building

[Explore all](#)

Organization Countries

Australia Switzerland Spain
 United Kingdom Japan Mauritius Mexico
 Netherlands Taiwan, Province Of China

[View on Map](#)

Most Recent Projects

- OpenStax College
- OER university
- Open Learning: Bridge to Success

[Explore all](#)

Most Connected Projects

- Kaleidoscope Project
- College Open Textbooks
- OER university

[Explore all](#)

Most Popular Themes for Projects

Use of OER

[Explore all](#)

Project Countries

Austria Belgium Canada
 Switzerland China Germany Spain
 France United Kingdom

[View on Map](#)

Figure 5. OER Project and Organizations Overview Page

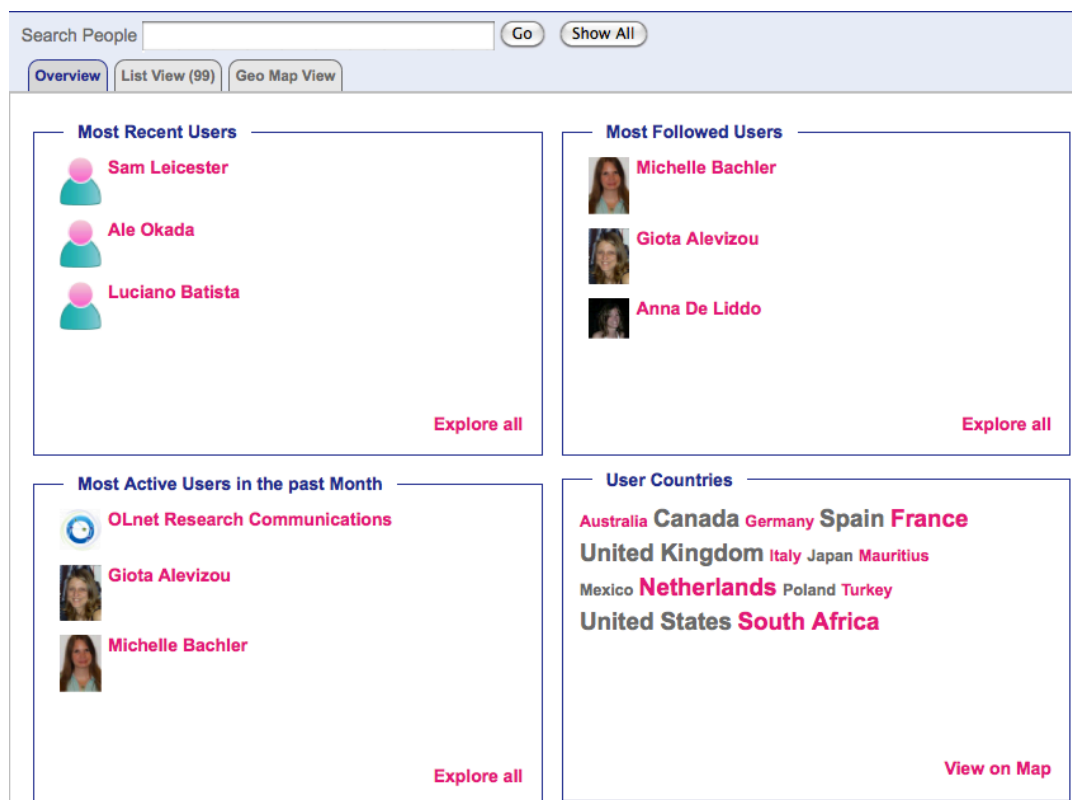


Figure 6. Evidence Hub users activities

Seeding Content

The sense-making features of the OER Evidence Hub can systematically support the open education movement in a number of ways; analysing, condensing and linking key messages from OER research. However, as discussed in the previous section, before the community can engage with such a tool it is first necessary to provide the Hub with relevant content. This has two main purposes. Firstly, it serves to illustrate the semantic architecture of the site, showing users how to distil and connect their own content and claims in the context of the challenge/solution dynamic of the site. Secondly, it provides a service to the OER community by offering a digested account of the evidence for and against OER which can be connected in novel ways, attracting the comments and votes of leaders in the field *collectively*.

An important precursor to this kind of activity is the process of identifying data sources, collating relevant materials, curating and analysing them to extract the key information. There is often a need for individual publications or other forms of scholarly activity to be digested in order to make them more accessible. The recent JISC OER impact report (Masterman & Wild, 2011), for example, comprised various focus groups, interviews, surveys, workshops and literature reviews. The report itself is almost 90 pages long; perhaps too long for many to read thoroughly. OLnet researchers analysed the report, breaking it down into the following key claims.³

- ‘Practical things that policymakers and advocates can do to promote the adoption of OER’
- ‘Institutional support for OER adoption’

³ <http://ci.olnet.org/explore.php?id=137108145400024718001315313007>

- ‘Academic staff who support learners can do a number of things to promote OER use among students’
- ‘Academic teaching staff should approach OER primarily as a means to enhance practice’
- ‘OER Impact on individual practice is most likely to be achieved within the dimension of social practice’
- ‘The role of logistical factors in inhibiting the large-scale uptake of OER is not to be underestimated’
- ‘A positive disposition towards the reuse and sharing of learning resources, together with an essentially collaborative outlook, are essential prerequisites for teachers’ uptake of OER’
- ‘The benefits of OER to individual educators’

These are linked to other claims, evidences, proposed solutions and challenges within the OER Hub, providing pathways through the debate that others can follow, redirect and connect in novel ways.

Through a similar process, the policy recommendations from the UNESCO/Commonwealth of Learning policy forum that took place late in 2010 at the UNESCO headquarters in Paris (UNESCO, 2010) were distilled directly into the OER Hub.⁴ The forum was attended by participants from 60 member countries. Their discussion was distilled to the following eight potential solutions.

- ‘OER is not just for open universities but can be used for any university’
- ‘OER can expose students to resources developed by others which will enhance their learning experience’
- ‘OER content can offer suitable acknowledgements to the original author(s)’
- ‘OER can assist in addressing issues around access to resources’
- ‘Collaboration between institutions could lead to reduction in costs as the development costs will be shared’
- ‘Good OER could enhance the reputation of those institutions producing the OER’
- ‘Top, world-class universities provide curricula and materials to developing nations’
- ‘Student involvement in the development of OER resources can be part of their learning process’

This kind of distillation activity can be a useful exercise in its own right, but providing this kind of analysis on research reports on behalf of the community is only a starting point for community involvement. Content needs to be relevant and reflect the real conversations that are taking place within the community.

Accordingly, the OLnet team worked with a number of prominent OER advocates to try to capture and influence the discussions that are taking place through the OER

⁴ <http://ci.olnet.org/explore.php?id=137108145400029591001315407654>

Hub. One of the most prominent uses of the platform thus far has been to distil and seed content from discussions taking place among of high-profile OER advocates. The ‘OER Advocacy Coalition’ on Google Groups has been an important source of content in this regard (OER-AC, 2012). The group has more than 120 members who work towards the promotion of OER and policies that support OER, serving as a communication vehicle and information repository for the emerging movement. News items, research reports, commentaries and informal discussions take place in the group every day, meaning that it is a rich source of content that is deemed relevant by experts. Websites that are mentioned can be added to the list of resources in the Hub, and the essence of the data and claims made within them entered separately and linked up to the information already published.

There are a number of benefits to working with a group in this way. By using their own language and frames of reference, we can more authentically represent the thought and communication of the community and encourage them to participate in collective intelligence. By identifying connections between disparate pieces of information and opinion shared within the group, the OER Hub can make explicit important connections and contentions that might be in the background or held at the level of assumption. Importantly, the dynamic nature of the OER Hub allows members of the community to see the history of their own thoughts and discussions represented analytically and in a form that is useful for their work as advocates.

One of the most significant pieces of policy arising from the recent work of the group has been a simple policy recommendation with potentially profound consequences: that all publically funded research should be made available to the public under open licences rather than locked away behind paywalls or within the pages of expensive journals. The argument is simple and persuasive. The OER Hub provides a way for the community to show how such policies can make a difference to the challenges facing the education world by treating them as potential solutions and showing how they are related to other policies and the best evidence that is available. For an overview of the policy position, see Wiley, Green & Soares (2012).

Conclusions: Issues and Strategies for building CI platforms

Our research has confirmed that a pervasive challenge for building CI platforms is balancing a critical tension. This concerns the tradeoff between the need to structure and curate contributions from many people, in order to maximise the signal-to-noise-ratio and more advanced CI services (e.g. queries that no website can answer at present: *What is the most strongly evidence-based proposal? Which research has had most real world impact?*) — versus permitting people to make contributions with very little useful indexing or structure (the bias in most social web platforms), which is easier because it requires less reflection or learning how the site is structured. This tension is reported by every CI research group we know, most recently, at the CI workshop we chaired at the CSCW conference⁵. It is fair to conclude that we have made some progress in this project with respect to this challenge, but it is a very tough problem, and far from solved.

⁵ For more information about the CI workshop at CSCW2012 please visit: <http://events.kmi.open.ac.uk/cscw-ci2012/>

To date we cannot claim to have built a large, actively contributing user community. Rather like Wikipedia, the majority of data from diverse sources has been entered by a small percentage of editor/champions (but since our overall numbers are far lower than Wikipedia, the numbers are also small). In the early stages of a new CI site, it is inevitable that the burden falls on the project champions to populate the site in order to demonstrate the concept with meaningful examples. An open research question is whether higher level CI (ie. not just aggregating low level data such as clicks and ratings, but issues, solutions and evidence) can be structured by ‘normal people’ (rather than structured data enthusiasts such as those who built freebase.com), or whether the skills of curation and mapping will remain the preserve of a minority, with the majority of contributors submitting relatively conventional freeform texts with a few tags.

A number of strategies could be considered to address this challenge in future work:

- A bootstrapping strategy is to fund a project specifically to resource subject matter experts in each of the Hub’s themes to serve as knowledge curators in their field, and build a network of curators.
- Another is to invest in a project to pilot smarter semantic and language technologies to convert freeform text as it is found on the web, into more structured, semantically indexed databases.
- Another strategy is to require the submission of structured summaries by members of the OER community – but this option of course only applies to members for whom this might be a formal requirement, e.g. specified by a project funder or leader.
- Another strategy is that research groups resolve to distill their findings in this way, as part of their academic commitment to knowledge dissemination and debate (e.g. a commitment that the network of UNESCO Chairs in open education might consider).

Acknowledgements

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