KNOWLEDGE EXCHANGE BRIEFING PAPER
THE IMPACT OF OPEN ACCESS OUTSIDE EUROPEAN UNIVERSITIES
Knowledge Exchange is a co-operative effort that supports the use and development of Information and Communications Technologies (ICT) infrastructure for higher education and research.

The Knowledge Exchange partners are:

- Denmark’s Electronic Research Library (DEFF) in Denmark
- German Research Foundation (DFG) in Germany
- Joint Information Systems Committee (JISC) in the United Kingdom
- SURFfoundation in the Netherlands
The Open Access movement has encouraged the availability of publicly-funded research papers, data and learning content for barrier-free use of that content without payment by the user. The impact of increasing availability of content to researchers in European universities is understood in terms of easier access to previous research and greater exposure for new research results, bringing benefits to the research community itself. A new culture of informal sharing is evident within the teaching and learning communities and to some extent also within the research community, but as yet the growth in informal sharing has not had a major effect upon the use of formal publication choices. This paper explores the impact of open access upon potential users of research outputs outside the walls of research-led European universities, where the economic value of open access may be even greater than the academic value within universities. The potential impact of open access is understood in many communities but requires a greater volume of open access content to be available for the full potential to be realised. More open access content will become available as the opportunities in open, internet-based digital scholarship are understood.
1. **“AMAZING STORIES OF OPENNESS”**

Placing open access to research papers in the context of a broader movement towards openness highlights a potential which has yet to be realized. Particularly striking is the impact of openness in teaching and learning.

Within the world-wide educational community of learners and teachers, the sharing of information, ideas and content related to education is now accepted and widespread. As with other aspects of openness, this revolution in educational practice has been made possible by access to the internet, but a unique feature of sharing amongst teachers and learners is that the developments have been “bottom-up” rather than “top-down”. This is not an institution-led movement, and although piecemeal in the sense of being one individual sharing with another individual or within a learning group, the scale of the interaction is huge. Although this revolution is taking place within universities, its impact outside universities should not be underestimated, as learners share with family and friends the experience of a culture of sharing.

**Open sharing through open routes.**

The information, ideas and content have been shared through a variety of widely accessible routes such as Facebook, YouTube or Slideshare. The content shared is rarely the peer-reviewed, formally-published content familiar to the research community but contributions by individuals shared with other individuals – maybe other individuals in a different hemisphere – working in the same area. Sometimes the individual contributions coalesce into a group document which may receive endorsement from a teacher. Sometimes the sharing of such content may lead to an unanticipated comment or contribution from a third party. Sometimes the sharing over the internet may lead to travel to meet a contributor. The only common factor between all the individuals is that they have a willingness to share their ideas and content over the internet.

**The impact of sharing.**

Much of the sharing between learners and learners and between learners and teachers goes unrecorded. Attention has been paid to the growing volume of content available as open educational resources, and the value of such “top-down” content to learners and teachers is huge. The impact of the informal sharing described above is upon a community changing its priorities and benefiting from the change. It is unremarkable in the sense that it is common practice, but some examples have been made available through blogging. One blogger draws attention to the amazing nature of this new form of educational practice and provides videos to illustrate such “Amazing Stories of Openness”, “amazing” – and unanticipated - in the sense of the benefit to individual teachers and learners who share. One of the stories describes how a presentation on Creative Commons (CC) by a Canadian teacher was spotted by a Swedish teacher who sent a handbook on CC to the Canadian teacher who blogged successfully for a translator, and thus the Swedish handbook was made available to a wider audience. Such benefits from international “sharing upon sharing” illustrate the power of this internet-enabled educational revolution, a power which has yet to realise its full potential.

2. **OPEN ACCESS FOR WEALTH CREATION**

The value of publicly-funded research to small and medium-sized enterprises is recognised.

One of the areas capable of illustrating the benefits of open access outside universities is the availability of publicly-funded research papers to small wealth-producing commercial enterprises. The potential can be illustrated from statistics published in a report by Mark Ware for the Publishing Research Consortium on “Access by UK small and medium-sized enterprises to professional and academic information”. Mark Ware reports that “there is a subset of SMEs for whom access to research literature is highly important to their success”. While the report paints a largely positive picture about current access, there is still a substantial gap between the need for access to publicly-funded research reports and the current provision.

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1 A sign that the UK educational community recognises the value of open content lies in the award of prizes for new initiatives in the “Jorum Learning and Teaching Competition” www.jorum.ac.uk/community/
2 The blogger, Alan Levine, presented a selection of stories at the Open Education Conference in Vancouver in 2009 under the title “Amazing Stories of Openness” (see http://cogdogblog.com/stuff/opened09/) and a further selection in 2010 under the title “Amazing Stories of Sharing” http://cogdogblog.com/stuff/amazing10/.
The potential value of open access to SMEs is recognised, but the potential is not as yet realised.

Open access has the potential to bridge the gap between need and provision, providing easier access for SMEs to research reports than by making special arrangements to use a university library, order copies of articles through document delivery services, or contact an author directly. The PRC survey found that 10% of SMEs already obtain content through OA journals and 4% through OA institutional repositories. The open access channels are therefore recognised by SMEs but are either not used or not capable of being used to secure access to the content SMEs need but cannot obtain through other channels. Use of open access content by commercial companies is likely to increase when more open access research content than toll-access content is available through the internet. The potential for an increase in use of open access content by SMEs is confirmed by a report for JISC by Key Perspectives, which concluded that SMEs are deterred from accessing published research reports by cost. However the same report pointed to other kinds of barriers for SMEs in accessing grey literature available from universities, for example in SMEs being unaware of relevant research being undertaken in universities.

Realisation of the potential requires more than a change in the publication business model.

The adoption of an open access business model for making research reports available is an important factor if publicly-funded research is to have a substantial impact upon wealth-creating SMEs. Securing greater take-up of open access within the research community is recognised to be a cultural issue, requiring changes to well-established attitudes and practices, and likewise securing greater use of open access content by the SME community is partly a cultural issue, requiring greater understanding by universities and by SMEs of the relationship between innovation in the private sector and access to publicly-funded research reports. In some countries there is closer working between academia and industry than in other countries and it is in those situations that the impact of open access to publicly-funded research is likely to be greatest. A high impact of open access upon wealth-creation requires both a high volume of open access content to be available and a working relationship between research-creators and wealth-creators.

3. OPEN ACCESS FOR INDIVIDUAL TAXPAYERS

Discussion of the impact of open access upon individuals has largely been concentrated in two areas: in the area of medical benefits and in the area of economic benefits for taxpayers. The benefit from open access to medical literature was identified in the early days of open access. A widespread wish from individuals and their families coping with serious medical problems to learn of new drugs or new cures provided a powerful argument for open access. Peter Suber placed this benefit for individuals into a broader context in an article in the “SPARC Open Access Newsletter”. He wrote of his own use of medical literature to research medical conditions as a layman, use which was valuable to him. However, Peter went on to point to the greater value from open access to medical literature in assisting researchers to make more advances which would benefit everybody, and not only those individuals who took the trouble to read the medical literature. Peter wrote: “Access by medical researchers will help everyone by accelerating the progress of medicine, while open access by individual sufferers will only help a much smaller number of people and in much less significant ways.” Perhaps the greatest example of the impact of open access upon medical research is the open human genome data, which is transforming medical research and promising

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6 Key Perspectives "Study on the availability of UK academic grey literature to UK SMEs" December 2008 http://www.jisc.ac.uk/media/documents/aboutus/workinggroups/grey/literaturereport.pdf

7 Considerable academic attention has been paid to the application of innovation in the private sector (e.g. the work of the Manchester Institute of Innovation Research) but little attention paid to the relationship between up-take of innovation and the availability of academic research publications.

8 One such case of a mother, Sharon Terry, attempting to gain information about a rare disease suffered by her two children was highlighted by SPARC at a Forum held in January 2005, webcast available at http://www.arl.org/sparc/bm–doc/SPARCForum_SharonTerry.mov

9 "SPARC Open Access Newsletter" issue no. 65, September 4 2003 http://www.earlham.edu/~peters/fof/newsletter09-04-03.htm
benefits to millions of sufferers from a range of medical conditions. If this access to data could be matched by similar open access to the text of medical journals, the benefits from open access to individuals would be multiplied.

The economic benefit from competition in publishing research outputs.

As the open access movement developed attention began to be paid to the economic benefits from open access, benefits for the taxpayers providing the funds for academic research. The taxpayer case for open access developed from a legitimate view that taxpayers should have access to publications reporting research they have funded into studies of the economic impact and value of various ways of disseminating publicly-funded research. The early studies of the economic impact of open access focused upon the role of competition in reducing the cost of scholarly journals, as with the new journals set up by SPARC. The attention paid to competition as a catalyst for change has continued through the development of new journals funded through publication charges, the argument being that when an author or a research funder is directly responsible for the cost of publication, greater interest will be paid in the level of such charges than in the cost of library subscriptions. While the potential for the economic benefit from competition remains, the ownership of content in “must-have” journals by commercial companies is holding back the process. The retention of copyright by authors will be necessary to enable competition to become effective in reducing the cost of publication.

Impact as a full economic model of costs and benefits.

More recent studies of the economic impact of open access have taken a broader view of the costs and benefits of the entire scholarly communication process, from the costs incurred by authors in writing research papers through the costs of the research dissemination process into the economic benefits from the process. This broad approach has overcome the weakness in early studies of the research dissemination process in looking only at one stage in the process, e.g. the stage at which costs were incurred in publishing a research paper. The broad approach enables governments, research funders and the taxpayer to draw conclusions about the cost-benefit ratio in making publicly-funded research available through various dissemination routes. This approach has been pioneered by Professor John Houghton and his colleagues at Victoria University and the model applied to different economies in various parts of the world, with different results in particulars but with a consistent conclusion that open access provides the dissemination model with the highest cost-benefit ratio. Part of the benefit from open access Professor Houghton and his colleagues outline could come from improvements in the application of innovation within the private sector. It remains to be seen what impact the consistent message of benefit from open access will have on the publishing practice of individual researchers, but research funders are already mainly supportive of a transition to open access.

4. OPEN ACCESS FOR EMERGING AND DEVELOPING ECONOMIES

The Budapest Open Access Initiative described the world-wide benefit from open access as “share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.” The open access movement is international in nature and its impact is understood to be international, as soon as research papers are on the internet without any price, legal or technical barrier. The benefits from open access for

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10 The web-site of the Sanger Institute describes the importance of the genome data: “The complete sequence is freely and publicly available and provides a priceless resource for all genetic research into human health and disease.” [http://www.sanger.ac.uk/about/history/achievements.html](http://www.sanger.ac.uk/about/history/achievements.html)

11 This is the view of the US Alliance for Taxpayer Access, “a coalition of patient groups, physicians, researchers, educational institutions, publishers, and health promotion organizations that support barrier-free access to taxpayer-funded research.” [http://www.taxpayeraccess.org/](http://www.taxpayeraccess.org/)


14 The Budapest Open Access Initiative commenced in 2002 as an international movement to promote the toll-free availability of publicly-funded research over the internet [http://www.soros.org/openaccess/index.shtml](http://www.soros.org/openaccess/index.shtml)
countries with emerging or developing economies do not only come through access to research papers from wealthy countries but also from increased exposure world-wide to research papers from poorer countries. Such countries have suffered from the dominance of North American and European journals in the existing impact factor ratings, and open access offers higher citations and increased use of articles published in alternative peer-reviewed outlets. Currently open access is too early in its development for there to be conclusive evidence of greater awareness of research conducted in countries outside North America and Europe, but the support for open access in these countries indicates that the potential for benefit to their own research programmes is understood.

*A growing commitment to open access within countries with emerging economies.*

The evidence for support for open access in countries with emerging economies lies in the numbers of open access repositories and open access journals being established in such countries, the establishment of a repository or a journal being one of the first steps any organisation or institution committed to open access might take. The evidence comes from three sources, the database ROAR, the database DOAJ and the organisation eIFL. ROAR, the Registry of Open Access Repositories, paints a very patchy picture of repository development in countries in transition. Some of the South American countries compare well with some countries in Europe, with 14 open access repositories being recorded in Argentina and 72 in Brazil at the end of August 2010. The impact open access is making in South America is confirmed by the strong development of open access journals in that continent, in 2010 organisations and institutions in Brazil publishing 473 open access journals, second in number only to the United States. On the other hand ROAR suggests less commitment to open access with only one repository recorded in each of three African countries, two in each of four countries, and only the more developed country of South Africa recorded as having 27 repositories at the end of August 2010. South Africa also appears in the DOAJ list as being the African country most committed to open access publication, although Nigeria shows a stronger commitment – with 18 OA journals – to open access publication than to open access repositories.

**Visibility of research understood to be the most significant impact factor.**

More information on open access developments in countries with emerging economies is available from the organisation eIFL. In June 2010 eIFL published a “Report on open repository development in developing and transition countries”, the Report being based on a survey to which 49 repositories in 20 countries on three continents responded. The survey respondents include some repositories not included in ROAR. The importance of visibility for research papers from countries invisible in North American and European publications is illustrated by the 83% of respondents who cited visibility for the research outputs from their institutions as the primary driver for establishing an open repository. However, the survey also shows how the growth in open access content in countries in transition is held back as much as in countries with well-established economies by the lack of institutional policies supporting open access.

5. **OPEN ACCESS IMPACT POTENTIAL YET TO BE REALISED**

*The value of open access as part of the value of openness.*

A report by the Computer and Communications Industry Association identifies a value to the US economy of $4.7 trillion from fair use exceptions to US copyright law. This fact illustrates the potential of lifting restrictions upon access to knowledge in today’s knowledge-based economies. Open access is part of a

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15 ROAR is available at http://roar.eprints.org/
17 eIFL has been working in developing countries to increase access to academic content since 1999 http://www.eifl.net/.
18 Report on open repository development in developing and transition countries* by Iryna Kuchma and Brian Rosenblum http://www.eifl.net/sections/services/eifl-oa/docs/report-on-open.
growing trend towards barrier-free access to content. From the beginning of the open access movement the potential for users of research papers and learning content outside universities to benefit from open access to work funded from the public purse has been understood. With eight years of hindsight that potential is still valid but has not as yet been realised. The key to unlock the potential in open access may come though difficult economic situations. The restrictions upon sharing promoted by legislative bodies across the world have benefited some commercial interests, but the growing culture of sharing has the potential to yield benefits to many more people and to have a greater economic impact than a culture of restrictions.

Who has the responsibility to effect change?

To a certain extent the responsibility for a growth in impact lies with the research community itself. There is some evidence of a growing culture of openness within the research community through use of new communication channels similar to those in use in the education community, but apart from within the biomedical community this informal sharing has not translated into more formal sharing of published research text and data. Well-established academic practices and commercial interests are holding back changes which will enable research openness to have its full impact in due course. Academic promotion and tenure procedures are still tied to impact factors derived from publication models which do not allow the full impact of research outputs. Individual researchers need stronger support from their funders and employers to use peer-reviewed open access outlets for their research.

Why the impact of publicly-funded research outside universities will grow through open access.

Research itself and the use of research outputs has been transformed by access to the internet. The move to internet-based digital scholarship has huge implications for the way in which research is conducted and distributed, and for the level of impact of publicly-funded research. Martin Weller Professor of Educational Technology at the UK’s Open University has characterised digital scholarship as “open, digital and networked”, the combination of all three characteristics marking “a very significant alteration and potential for changes in scholarly practice”. It is also the combination of these characteristics that has the potential to transform the impact of publicly-funded research outside the research-led European university. Academic publication is already changing in response to internet-based digital scholarship and will continue to change. The change may be painful for some but the overall impact of openness in research and in teaching will be beneficial for all both within and without the walls of European universities.

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October 2010

With thanks to Neil Jacobs of JISC and other Knowledge Exchange colleagues for their comments on a draft of this paper.

20 The use by researchers of social networking and other new sites encouraging sharing is covered by Dr. Liz Lyon in her report to JISC on “Open science at web-scale” available at http://www.jisc.ac.uk/publications/reports/2009/openscienceconcept.aspx

21 See the slidecast on Martin Weller’s blog at http://nogoodreason.typepad.co.uk/no_good_reason/2010/07/thoughts-on-digital-scholarship.html