Publishers work together to provide electronic access to authoritative publications for the Research Assessment Exercise

Introduction

The Research Assessment Exercise (RAE) is an expert review project to evaluate the quality of research in UK higher education institutions (HEIs). This assessment informs the selective distribution of funds by the UK higher education funding bodies and is administered by the Higher Education Funding Council for England (HEFCE) on behalf of the Councils in England, Northern Ireland, Scotland and Wales.

The four higher education funding bodies intend to use the outcomes of the exercise to determine their grant for research to the institutions which they fund with effect from 2009/10 – over £1.5 billion per year will be allocated for research using the results of the 2008 RAE. Any higher education institution in the UK that is eligible to receive research funding from one of these bodies was eligible to participate in the exercise.

RAE submissions are made to expert panels by eligible HEIs in one or more of 67 discipline-based subject areas. The primary purpose of RAE 2008 is to produce a ‘quality profile’ indicating the percentage of research judged to have reached each of a number of quality levels for each submission made by an institution. A submission contains information about the research undertaken in a unit or department including details of the research-active staff selected by an institution for inclusion in the exercise, and up to four research outputs produced by those staff between 1 January 2001 and 31 December 2007. The outputs comprise a very wide range of materials in addition to the common printed research publications, e.g. exhibitions, compositions, patents, designs, but the majority of research outputs are journal articles. The outcomes, including the funding allocated using the results, are collective rather than individual. Nevertheless, there are often perceived to be incentives (particularly in terms of career progression and status) for individuals to be included in their institution’s submission.

In 2001, panel members were initially expected to find outputs cited in RAE submissions using their own library resources (most are based at UK HEIs and therefore have access to academic collections). Where an output was not available,
panel members could request these from the RAE team at HEFCE. Institutions had to be able to supply a paper copy of any output requested within three working days, or face the prospect that it would be discounted from the assessment altogether. Although the process was ultimately effective, all the key players involved in the RAE – the RAE team at HEFCE, the panel members and participating HEIs – were agreed that this system needed to be overhauled.

Improving upon the cumbersome, largely paper-based processes of the 2001 assessment exercise was the challenge presented to the publishing community during the planning stages for the 2008 RAE by HEFCE. Facilitating electronic access, without authentication barriers or onerous licence conditions, was the desired outcome.

After discussions with the Publishers Licensing Society (PLS), an enabling organization owned by UK trade associations, approval in principle was obtained from the publishing community, and work began to find some solutions.

With the 2008 RAE just published, it is timely to look behind the scenes at the choreography involved in constructing a single licence for free online access to over 190,000 full-text journal articles.

**Method and challenges**

So much for the plan: what about the implementation?

It fell to PLS\(^2\) to broker a deal to allow fee-waivers and direct access to publisher content, and to co-ordinate the project on behalf of publishers while working in close partnership with HEFCE. The PLS is a non-profit organization representing UK publishers on matters relating to collective copyright and collective licensing. PLS works with thousands of publishers both in the UK and internationally, operating with the trade associations for publishers’ rights.

**The content**

Work began with an analysis of research outputs submitted for the 2001 exercise. These were as follows (see Table 1).

Emphasis immediately focused on access to journal articles as these accounted for 70% of the submitted research outputs in the 2001 RAE and would most readily be accessible electronically.

<table>
<thead>
<tr>
<th>Output type</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>authored book</td>
<td>14,468</td>
<td>7%</td>
</tr>
<tr>
<td>edited book</td>
<td>3,716</td>
<td>2%</td>
</tr>
<tr>
<td>chapter in book</td>
<td>23,330</td>
<td>11%</td>
</tr>
<tr>
<td>journal article</td>
<td>143,117</td>
<td>70%</td>
</tr>
<tr>
<td>conference contribution</td>
<td>7,165</td>
<td>3%</td>
</tr>
<tr>
<td>patent/published patent application</td>
<td>229</td>
<td>0%</td>
</tr>
<tr>
<td>software</td>
<td>130</td>
<td>0%</td>
</tr>
<tr>
<td>report for external body</td>
<td>1,509</td>
<td>1%</td>
</tr>
<tr>
<td>confidential report for external body</td>
<td>129</td>
<td>0%</td>
</tr>
<tr>
<td>Internet publication</td>
<td>605</td>
<td>0%</td>
</tr>
<tr>
<td>Internet publication (via subscription only)</td>
<td>119</td>
<td>0%</td>
</tr>
<tr>
<td>performance</td>
<td>924</td>
<td>0%</td>
</tr>
<tr>
<td>composition</td>
<td>763</td>
<td>0%</td>
</tr>
<tr>
<td>design</td>
<td>1,052</td>
<td>1%</td>
</tr>
<tr>
<td>exhibition</td>
<td>3,840</td>
<td>2%</td>
</tr>
<tr>
<td>artefact</td>
<td>959</td>
<td>0%</td>
</tr>
<tr>
<td>scholarly edition</td>
<td>758</td>
<td>0%</td>
</tr>
<tr>
<td>other form of assessable output</td>
<td>2,482</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>205,295</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

*Table 1.* Research outputs submitted for the 2001 RAE by type

However, the RAE team was acutely aware that in some subject areas other output types would be predominant, and that in some cases these too would in theory be available electronically (for example, conference proceedings and chapters in books).

**The users**

RAE panel members increasingly wanted access to materials, particularly journal articles, in electronic form. They required access to the authoritative final version of an article, and not to a pre-print held, for example, in an institutional repository. However, the panel membership could not be regarded as homogeneous. In all there were about 1,000 panel members across 67 subject-based panels, covering the full spectrum of research activity from cardiovascular medicine to music. Both the nature of the outputs submitted to different panels and the way in which the panel members themselves wished to engage with the submitted material varied. To avoid over-complexity, and to limit the burden on the providers of the material, it was necessary to make some compromises. Most significantly, the decision was taken to make electronic submission of journal articles obligatory, and to collect all other printed output types in hard copy form.
Table 2. 2008 RAE submissions showing submission types by panel.

The subject coverage for each panel is described at http://www.rae.ac.uk/panels/. This table shows that over 50% of all conference contributions submitted to the exercise were sent to Main Panel F (which includes computer science) whilst the most diverse array of output types were submitted to Main Panel O. For all the Main Panel areas from A–E (which cover the medical, biological and physical science disciplines) at least 90% of submissions were from journals. In panels L - O (which cover the humanities and arts) books and chapters were more significant.
HEFCE\textsuperscript{3}, as the organization which administers the RAE, also had an interest in finding a more streamlined approach to this. The system in 2001 was so heavily used that it compromised HEFCE’s own postal systems. The move to electronic provision supported this interest, as did the decision to collect all other outputs from institutions and store them in a dedicated RAE repository on a different site from the HEFCE offices. As Table 2 (on p. 62) shows, the focus on journal articles was justified as overall 75% of outputs submitted were of this type, indicating a further shift towards this medium of dissemination.

**The technology**

Various technical challenges related to facilitating electronic access were explored, and – through collaboration with CrossRef and Eduserv – solved. This meant that it was possible for RAE panel members to access full-text electronic content directly from publisher websites. HEIs were required to provide the digital object identifiers (DOIs) alongside other bibliographic information to HEFCE, which then populated a secure data collection system with links to full text via CrossRef DOIs. This required changes to the design of the RAE data collection system, with the provision of a specific field for the DOI of journal articles, and a facility for HEIs to check DOIs against the CrossRef database. A virtual Athens organizational ID was established for the RAE, and publishers added this information into their customer records. This allowed HEFCE’s systems team to automatically download the full text of the vast majority of those outputs which were provided via the DOI. CrossRef and Eduserv kindly provided these services at no cost to publishers or HEFCE. Where DOIs were not available, institutions had to provide a scanned PDF of the full text of the output. These PDFs were added to the database of output captured via the DOI, and then made available to the relevant panels via a secure website and a specific CD/DVD.

**The higher education institutions**

The process employed in the 2001 RAE of providing outputs at three days’ notice was very inconvenient for HEIs. It required each HEI to have some type of temporary repository for RAE outputs and someone on standby to respond to requests from panels throughout the assessment phase. Informal consultation with institutional RAE contacts indicated that there would be a preference for collecting some material electronically, and for collecting all submitted output at the beginning of the assessment phase and returning it to HEIs once the exercise was completed. Institutional familiarity with DOIs was relatively limited, and there were numerous queries about identifying and resolving DOIs to the RAE team in the lead-up to the submission deadline. Learning about how DOIs work was undoubtedly an additional challenge that those responsible for RAE submissions in University administrations needed to overcome during their preparations for the exercise.

**The licence**

There were several unique features of this licence: it was a publisher-focused collective licence; it provided access to works published internationally (although all the authors were based in the UK); it facilitated electronic access to full-text content controlled on publishers’ sites.

The licensed material was accessible only to RAE panel members and to HEFCE staff administering the RAE, the works were made accessible only for the purposes of conducting the RAE, and it was agreed that all text would be deleted from the data collection system at the end of the exercise. PLS has the right to audit the deletion of materials from the data collection system. The exercise will formally end in June 2009, by which time the submissions made by HEIs, including the bibliographic details of the outputs cited, will be made publicly available.

Book, journal and magazine submissions which are not accessible in an electronic format were also needed by RAE panel members. For this reason HEFCE also needed the right to authorize universities to photocopy or scan the full text of submissions for deposit in the RAE repository. Although university staff (often librarians or research administrators) did the photocopying or scanning, the universities were not authorized to retain a copy or to store copies in any way, including in institutional repositories.

The licence negotiated between HEFCE and PLS was free of charge and issued by the Copyright Licensing Agency (CLA). No fee was charged despite the fact that it has value for HEFCE in significantly saving administrative costs. This reflects the fact that photocopied works underpinned previous RAES at no cost under a ’gentleman’s...
agreement’ between HEFCE and publishers, and also the value to the publishing industry in demonstrating that it can work collaboratively to provide extremely innovative licensing and access solutions.

To grant such an international licence, PLS minimized its risks in the following ways:

- no new precedent was set for photocopying rights as there had been a ‘gentleman’s agreement’ in place to underpin previous RAEs
- in order to scan from print, at least one university had to purchase original work
- wide dissemination of the news to the publishing community through international trade associations and CrossRef
- for digital access to works behind authentication barriers, the participating publishers needed to opt-in by voluntarily adding an RAE account into their authorization modules
- large multinationals had seen the licence in advance and approved it.

The publishers

As one would expect, building momentum was a challenge and early endorsement by influential organizations played a critical role in the success of this project. In particular, support from the Association of Learned and Professional Society Publishers, the Publishers Association, the International Publishers Association, and the International Association of Science, Technical, and Medical Publishers was essential. Early adopters also played a critical role and these publishers included Blackwells, the British Medical Journal, Cambridge University Press, Elsevier, the Institute of Physics Press, Oxford University Press, the Royal Society of Chemistry, SAGE, Taylor & Francis and John Wiley & Sons.

PLS first approached a senior publisher in each company. This sometimes led to immediate ‘in principle’ approval, but more often triggered the start of careful internal discussion within the company. Most of the larger publishers carefully considered the background to the agreement and reviewed the full text of the licence prior to committing themselves. Many publishers consulted with their trade bodies, and sought additional information from the PLS. A number of international publishers sought a deeper understanding of the purposes of the RAE and the detail of the process itself, which was provided by the RAE team.

Translating an agreement in principle into action occasionally proved challenging. Different teams within each publishing company needed to take action. For example, sales teams added the RAE account into their customer databases, and technical teams liaised with HEFCE over authentication arrangements – especially if they did not use Athens – and also resolved any out-of-date DOIs. A very small number of publishers preferred to have a direct agreement with HEFCE rather than participating under a collective licence, and in these cases legal teams drafted bespoke agreements. Larger commercial publishers consulted with the learned societies for whom they publish to gain support for the inclusion of titles. Much of this action happened quite naturally, but a certain amount of chasing was required by PLS and HEFCE teams, who were assisted in this task by John Cox Associates.

Table 3. Publishers who provided electronic access for the 2008 RAE

<table>
<thead>
<tr>
<th>Acoustical Society of America</th>
<th>American Chemical Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEAweb</td>
<td>American College of Chest Physicians</td>
</tr>
<tr>
<td>Alexandrine Press</td>
<td>American College of Sports Medicine</td>
</tr>
<tr>
<td>Allen Press</td>
<td>American College of Veterinary Pathology</td>
</tr>
<tr>
<td>Alliance Communications Group</td>
<td>American Dairy Science Association</td>
</tr>
<tr>
<td>AlphaMed Press</td>
<td>American Diabetes Association</td>
</tr>
<tr>
<td>American Academy of Neurology</td>
<td>American Geophysical Union</td>
</tr>
<tr>
<td>American Accounting Association</td>
<td>American Heart Association</td>
</tr>
<tr>
<td>American Association for the Advancement of Science</td>
<td>American Institute of Aeronautics and Astronautics</td>
</tr>
<tr>
<td>American Association for Cancer Research</td>
<td>American Meteorological Society</td>
</tr>
<tr>
<td>American Association for Clinical Chemistry</td>
<td>American Physical Society</td>
</tr>
<tr>
<td>American Association on Intellectual and Developmental Disabilities</td>
<td>American Phytopathological Society</td>
</tr>
<tr>
<td></td>
<td>American Psychiatric Association</td>
</tr>
</tbody>
</table>
American Psychological Association
American Physical Therapy Association
American Physiological Society
American Public Health Association
American Society of Agronomy
American Society of Animal Science
American Society for Biochemistry and Molecular Biology
American Society for Bone and Mineral Research
American Society for Pharmacology and Experimental Therapeutics
American Society for Cell Biology
American Society of Civil Engineers
American Society of Clinical Oncology
American Society of Hematology
American Society for Investigative Pathology
American Society of Nephrology
American Society of Plant Biologists
American Speech Language Hearing Association
American Thoracic Society
American Veterinary Medical Association
Annals of Family Medicine
Annual Reviews
Applied Probability Trust
Association for Computing Machinery
Association for Research in Vision and Ophthalmology
Association for Symbolic Logic
Atlantis Press
Australian Academic Press
Austrian Academy of Sciences
Baywood Publishing Company
Beech Tree Publishing
Berkeley Electronic Press
Berg
Berghahn Journals
BioMed Central
BioOne
Blackwell Publishing
BMJ Publishing Group
Brill
British Institute of Non-Destructive Testing
British Institute of Radiology
British Psychological Society
CABI Publishing
Cambridge University Press
Canadian Academic Accounting Association
Canadian Medical Association
CFA Institute
Channel View Publications
Cleft Palate-Craniofacial Journal
Cold Spring Harbour Laboratory
Commonwealth Forestry Association
Company of Biologists
Cornell University Library
CSIRO Publishing
de Gruyter
Duke University Press
Ecological Society of America
EDP Sciences
Elsevier
Emerald
Endocrine Society
Environmental Health Perspectives
EPP Publications
Equine Veterinary Journal
Equinox Publishing
European Respiratory Society
Faculty of Family Planning and Reproductive Health Care
Faculty of General Dental Practice
Federation of American Societies for Experimental Biology
Genetics Society of America
Geological Society of America
Geometry & Topology Publications
Guilford Press
Harvard Business
Health Affairs
HFSP Publishing
Hindawi Publishing
Histochemical Society
Hogrefe and Huber Publishing Group
Human Factors and Ergonomics Society
Humana Press
IEEE
IFP
Inderscience Publishers
Indiana University Press
Institute for Operations Research and the Management Sciences
Institution of Chemical Engineers
Institution of Engineering and Technology
Institute of Mathematical Statistics
Institute of Physics
intellect
International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers
International Association of Hydrological Sciences
International Society of Diabetes and Vascular Disease
Inter-Research
International Union of Crystallography
IWA Publishing
Japan Society of Mechanical Engineers
John Benjamins Publishing Company
John Wiley & Sons
Journal of Bone and Joint Surgery
Journal of Clinical Investigation
Journal of Marine Research at Yale University
Journal of Orthopaedic and Sports Physical Therapy
Journal of Rheology
J-Stage
JSTOR
Karger
The vast majority of panels, and panel members, found the electronic provision of journal outputs beneficial in assessing the enormous amount of material associated with the RAE. However, a number of minor complications arose during the assessment phase. There were a number of panels (or individuals within panels) who were prepared to consider outputs only in hard copy form, and the RAE team therefore had to make arrangements to print physical copies of outputs from the PDFs in greater numbers than anticipated. There were also calls, from both panel members and some institutions, to treat conference proceedings in some areas, most notably computer science, in the same way as journal articles, which would have significantly increased the complexity of the process of collecting outputs for HEIs. There were only a relatively small number of erroneous DOIs provided as there were systems in place to check the DOIs against the CrossRef database; in these cases it was relatively straightforward to ask HEIs to resupply these in scanned PDF form. Finally, there was a very small residue of journal articles which, because a publisher refused or did not respond to requests, were not available through these mechanisms, and contingency arrangements...
to provide these outputs were put in place where necessary.

In summary, this innovative partnership approach enabled free access to over 190,000 electronic journal articles for the 2008 RAE and will aid the UK funding bodies in allocating funding to the HEIs. Project partners included HEFCE, the PLS, CrossRef, Eduserv, the CLA and a wide array of publishers and publishing trade associations.

The project was conceived very much as a one-off: it was for a worthy cause, and, in order to be efficient it required collaborative action by publishers. Furthermore, there were detailed technical issues to address. It does, however, seem a shame not to license the resource created through this exercise for appropriate further use. It involved so much effort by so many parties to create a unique and intriguing resource of high quality research from UK academics.

References

1 RAE 2008: http://www.rae.ac.uk/ (Accessed 26 January 2009)


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