The Issues of Scholarly Communication and Research Assessment in the 21st Century

GRIPS Seminar: Policy for Higher Education and University-Industry Cooperation

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National Institute of Informatics
Today’s Talk

1. Importance of ScholCom
2. Serial Crisis and e-Journals
3. OA Movement against serials crisis
4. Issues of Hybrid Journals and the Flipping to OA
5. Impact of Plan S: Need for institutional APC support system
6. Need for non-commercial Publishing Platforms
7. Negative effects of ScholCom on scholarship
8. Various attempts to change research assessments
9. Concluding remarks
1. Importance of ScholCom
What is ScholCom?

- Scholarly communication involves the creation, publication, dissemination and discovery of academic research, primarily in peer-reviewed journals and books.

- It is “the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use.”

- This primarily involves the publication of peer-reviewed academic journals, books and conference papers.

https://en.wikipedia.org/wiki/Scholarly_communication
Research outputs are based on preceding research outputs

“If I have seen further it is by standing on the shoulders of Giants.”

—Sir Isaac Newton (1675)
The meaning of research article for researcher

✓ Learn preceding research
✓ Disseminating own research
✓ Being evaluated from the research output
Research articles are the core embodiment of research outputs.

The meaning of “research articles” for researchers are the same as “vegetables” for farmers.
Meaning of scholarship to humankind

☐ Make people’s life richer
☐ Understand the roots of human being and earth
☐ Frees life from illness and disasters
☐ Makes life convenient and efficient
☐ Enables to live wisely
☐ Leading to peace and happiness

Reasons why scholarship and higher education are regarded social capitals and funded by tax-payer’s money.
Royal Society’s Philosophical Transactions
...The start of “open” scholarship tradition

- Founded in 1665
- Basic functionality of academic journals invented.
  - Registration (date stamping, provenance)
  - Certification (peer review)
  - Dissemination and Archiving
- Removing the impediments of research communication through letters and secret codes.
  - Able to judge who was faster with new findings
  - Able to build on preceding research
The relation of the academies and publishers

- Publishers print and disseminate research.

- In print age, publishers were essential to disseminate and preserve research outputs.

⇒ Academy and publishers as mutually beneficial existence and co-prospering!
Importance of ScholCom for S&T policy-makers

- ScholCom as means of:
  - Promoting and facilitating research and innovation.
  - Understanding current research portfolio and draft S&T strategy.
  - Assessing research competitiveness and ROI.
2. Serials Crisis and E-Journals
How it started: “Serials Crisis”

- Journal subscription cost rising faster than the inflation speed
  - Four times higher in 2011 than 1986

*Includes electronic resources from 1999-2011.
E-Journals squeezing the books and printed matters

The impact of cancelling e-journals is so big!
# Comparing journals contracts by e-journals vs printed bulletins

<table>
<thead>
<tr>
<th></th>
<th>E-Journals</th>
<th>Printed Bulletins</th>
</tr>
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<tbody>
<tr>
<td>Purchase Item</td>
<td>Access Right</td>
<td>Printed Matters</td>
</tr>
<tr>
<td>Purchase Unit</td>
<td>Bundled Package or by Periodicals</td>
<td>By Periodicals</td>
</tr>
<tr>
<td>Durability</td>
<td>Not granted</td>
<td>Almost forever!</td>
</tr>
<tr>
<td>Available Titles</td>
<td>Many!</td>
<td>Purchased titles only</td>
</tr>
<tr>
<td></td>
<td>As much as offered by package</td>
<td></td>
</tr>
<tr>
<td>Usability</td>
<td>Instant Use, anytime, everywhere</td>
<td>Burdensome</td>
</tr>
<tr>
<td>Manageability</td>
<td>Easy to manage! Statistics also available</td>
<td>Burdensome</td>
</tr>
</tbody>
</table>

E-journals are so easy to use!
Elsevier’s Full-text DB: Science Direct

- Over 15 million publications
- Over 3,800 journals & serials, representing more than 612,000 issues
- Over 37,000 books, including reference works
- Digital archives that reach as far back as 1823

Top three publishers make more than half of subscription cost

Subscription cost of Japanese universities to international academic journals F.Y. 2017

The impact of top three are big!
When cancelling the Big Deal

- 2,000 Journals
  - 300 Journals: 0.9m US$
  - 250 Journals: 0.9m US$
  - 150 Journals: 0.9m US$
  - 70 Journals: 0.9m US$

E-journals subscription by journal titles

Printed Bulletins

E-Journals Big Deal
Japanese universities giving up on package subscription
All Universities in the World suffering

Over time, however, the actual value of these “big deals” has grown less clear. Publishers have often raised the price of the packages by 5-15%, far outpacing library budgets.

*(出典)* SPARC, “Big Deal Cancellation Tracking”
https://sparcopen.org/our-work/big-deal-cancellation-tracking/
Why does e-journal subscription cost rise?

- **Market failure**
  - Journal A cannot be replaced by Journal A’
  - Monopoly by few publishers

- **Increase in publications and users**
  - Publishers arguing on this point which is not acceptable to academics.
  - Researchers are peer-reviewing and editing on voluntary basis.
  - E-platforms should enable handling of massive contents at almost same cost as small amounts of contentse.

- **Developing new functionalities for journal platform**
  - Discovery and analytics (publication no, citations, IF, etc)
  - Publishers claim they develop because there are needs. However, do we really need these?
Elsevier’s Profit Margin at around 40%

- Operating profits
- Profit margin

Fig 7. Operating profits (million USD) and profit margin of Reed–Elsevier as a whole (A) and of its Scientific, Technical & Medical division (B), 1991–2013.

- Springer Science+Business Media (2012): 35%
- John Wiley & Sons’ Scientific, Technical, Medical and Scholarly division (2013): 28.3%
- Taylor and Francis (2013): 35.7%

Reed–Elsevier
37% Profit Margin! (FY 2017)

Revenue

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2,320</td>
</tr>
<tr>
<td>2017</td>
<td>2,478</td>
</tr>
</tbody>
</table>

Adjusting Operating Profit

<table>
<thead>
<tr>
<th>Year</th>
<th>Underlying growth +3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>853</td>
</tr>
<tr>
<td>2017</td>
<td>913</td>
</tr>
</tbody>
</table>


https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0127502

We are not writing articles for publishers to make money!
Differing Profit Margins by business type

Source: "Paywall: The Business of Scholarship Trailer 1". 2018
https://vimeo.com/217495703
3. Open Access Movement against serials crisis
We are writing the articles!

Isn’t it unfair that the publishers are making profit, and many academics cannot even afford to read the articles?!

The journal subscription is too expensive!

Paywall
Protest from Academia (2)

- “Subversive Proposal”
  - Steve Harnad (1994)
  - Called for scholarly articles to be freely available on the Internet, instead of published in print for the sake of royalties.

- “An Open Letter to Scientific Publishers”
  - 34,000 scholars worldwide (2001)
  - Called for the establishment of an online public library and pledging to refrain from publishing in traditional non-open-access journals.
Petition for Boycotting Elsevier — Cost of Knowledge

- Cambridge mathematician Timothy Gowers calling for Elsevier Boycott (2012.1.21)

- Asking not to publish, peer-review, edit at Elsevier journals.

  - 34 eminent mathematicians signing the “Cost of Knowledge” (2012.2.8)
  - More than 17 thousand people signing (2018.7)

1. The subscription cost too high
2. Requiring package contract and on top of it, their profit is 40%
3. They are constraining open exchange of knowledge

More information:
- Statement of Purpose
- How elsevier pricing policy reform page
- Read our blog, and follow the boycott on Twitter here.

http://www.thecostofknowledge.com/

Provided definition of OA

Two ways to achieve OA:

1. Self-Archiving (green OA)
   - Author’s final manuscript or the publisher’s version after a certain embargo period is archived on a website accessible worldwide.

2. Open-access Journals (gold OA)
   - Subscription fees are omitted instead of a fee charged to the author, usually called the article processing charge (APC).

Source: Budapest Open Access Initiative
http://www.budapestopenaccessinitiative.org/read
Self-Archiving — green OA

Making research articles available on the Internet.

- Institutional Repositories
- Disciplinary Repositories
- Online Sites
- Preprint Server
- PubMed Central

Upload Author’s Final Manuscript

Submit Article

Researcher

The copyright of printed–version belongs to the publishers. Thus, only final manuscripts are allowed to be made open.

Some libraries input the bibliographic metadata for the researchers.

Contents at repositories are searchable through research article discovery services such as OpenAIRE.

Most journals allow printed–version to be made available after certain embargo period.

arXiv, bioRxiv, SocArXiv
OA policy for enabling universities to publish author’s final manuscript

- Faculty of Arts and Sciences at Harvard to adopt the first OA policy to enable green OA.
- Hereinafter, other universities following.
- MIT to become the first university to adopt university-wide OA policy. (2009.3.18)

**[OA Policy]**

1. Faculty grants university right to disseminate the author’s final manuscript.
2. Author has the right to decide by each article.
3. Faculty deposits e-copy to institutional repository.
4. University makes article OA through institutional repository.

Source: MIT Faculty Open Access Policy
https://libraries.mit.edu/scholarly/mit-open-access/open-access-policy/
Number of OA policies adopted

The OA policies vary by institutions

Source: Registry of Open Access Repository Mandates and Policies (ROARMAP)
http://roarmap.eprints.org/
Open Access Journals — gold OA

OA journals make articles available open, instantly!

OA articles have chance for higher citation!

Hybrid Journals

Submit Article
Publish OA

Submit Article

Openly accessible!

Open accessed by articles
OA Journals ask researchers, not the readers and universities, to cover the publishing cost.

**Subscription Model**

- Researchers submit articles to the publisher.
- Sometimes, little fees are charged.
- The library distributes the journal.
- Researchers access the articles.

**Open Access Model**

- Researchers submit articles to the publisher.
- Researchers pay the APC (Article Processing Charge).
- The article is openly available.
- Researchers can access the article.

APC: Article Processing Charge
How many articles can you publish with average APC US$1000-2000?

Move at Governmental-level

☐ Protest from a medical patient
  ➢ “It is unfair that taxpayers do not have access to academic articles and thus cannot study their own medical condition, as the price of academic journals is exorbitant”.

☐ Funding agencies start making OA a mandate for scholarly articles funded publicly
  ■ NIH(US)-2008-“NIH Public Access Policy”
  ■ RCUK(UK)-2013-provides grant to universities for APC
The push which triggered US government to adopt OA policy
PubMed Central (PMC) — The first digital repository established by a funder to comply for OA mandate

- Online research articles archive in biomedical and life sciences established by NIH.
- As of 2007, NIH made OA a mandate for research outputs funding by NIH.
  - Researchers must archive their author’s final version on PMC.
- As of July 2018, about 5 million articles available.

(Note) PubMed Central is renamed to PMC in 2012.

https://www.ncbi.nlm.nih.gov/pmc/
The investment will enable a number of research-intensive UK institutions to kick-start the process of developing policies and setting up funds to meet the costs of article processing charges (APCs). This is in line with the recommendations of the Finch report on open access, published in June.
Limits and Merits

...Green OA

☑ Limits

➢ Burdensome to deposit the author’s final manuscript after publication.
  ✓ Researchers are not cooperative.

☑ Merits

➢ Even if the share of green OA is 10%, it gives bargeoning power against publishers.

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https://doi.org/10.7717/peerj.4375
4. Issues of Hybrid Journals and the Flipping to OA
Hybrid journals and double dipping...The smart publishers

Hybrid Journals

Double Revenue Stream!

Submit OA

Submit & Publish OA

Researcher

APCを払うと、OA出版してもらえる！

Prestigious Journal

Library

Librarian

‘Have to pay Subscription as it is only partially OA.'
Max Planck’s Proposal
...Flipping from subscription to APCs—OA2020

Worldwide Publishing Market

**Subscription Model**

- Market today subscriptions
  - € 7.6 bn
  - Current worldwide spending on subscriptions

- # 2m
  - Number of scholarly articles
  - 7.6 bn/2m
  - Current price per article publication
  - € 3,800

**Submission Model**

- Market transformed open access
  - € 4.0 bn
  - Estimated worldwide spending on open access publications after transition

- # 2m
  - Number of scholarly articles
  - € 2,000

EOI: 109 institutions from 35 countries

Before:
- Total cost becomes roughly half!

45% Buffer

€ 2,000 x 2m

Total cost becomes roughly half!
Max Planck to form transformative OA agreements with top 20 publishers

- The top 20 journals where MPG submits articles reaches 80%
- Among the 20, 5 are OA journals
- In 2017, MPG signed transformative OA agreement with three publishers.
- Other journals to follow?
- By 2020, there should be no more subscription payment for the top 20 journals.

Source: MPDL, "What will it take to secure open access to today’s scholarly journals?"
Transformative OA agreement for realizing OA2020... Publish & Read Model

Hybrid Journals

Openly accessible!

All OA!

OA article

OA article

OA article

OA article

OA article

OA article

Submit & Publish OA

Submit Article

Researcher

Researcher

Institutions which publish many articles will have to pay more than total subscription cost.

Institutions which publish less will be paying less.
Transformative agreement to full OA
Publish & Read Contract

OA ratio

Access to publication through subscription

Full OA

OA

Subscription-based contract

Publish & Read contract

Publishing contract
(Only APCs are paid)

Contract mode for Transforming to OA publishing.

Research-intensive university will have to pay more than at subscription-based contract.

Double dipping

Author pays APCs

Contract mode
The negotiation with Elsevier in Germany: Projekt-DEAL

- German Rector’s Conference takes the lead to negotiate with Elsevier on a national license under Publish&Read agreement after FY 2017.

State as of 2019.12

- Jan, 2017: 60 institutions loose access to Elsevier
- Feb, 2017: Elsevier restores access during negotiations
- Jan, 2018: Another 127 institutions not to update contract
- July, 2018: Germany to declare no more negotiations!
  → Elsevier cuts off access for institutions without contract
- January, 2019: Max Planck advocating for OA2020 also looses access.
- January, 2019: Germany and Wiley signs Publish and Read deal.
- August, 2019: Germany and Springer–Nature signs Publish and Read deal.
Status of other countries with large publishers

☐ Netherland
  ✔ Netherland government has set a goal for 60% OA by 2018 and 100% OA by 2020. Based on this goal, Netherland formed Publish& Read agreement with Elsevier for 2016-18.
  ✔ However, as Elsevier retains the right to determine which journal to be made OA, the agreement is not as desirable as Netherland wants it to be.

☐ Peru, Taiwan
  ✔ No agreement with Elsevier since January 2017.

☐ Sweden
  ✔ No agreement with Elsevier since July 2018.

☐ Norway
  ✔ Signs PAR deal with Elsevier for two years pilot. (April 2019)

☐ France
  ✔ Signs quasi PAR deal with Elsevier for four years. (April 2019)
US universities on OA2020

☐ Move by several small number of universities (2019.12.7)

■ MIT
  ➢ Signs PAR contract with Royal Society of Chemistry (2018.6)
  ➢ Draft Recommendations on Open Access to MIT’s Research (2019.3) mentioning to new modes of contract

■ University of California
  ➢ Fails PAR contract with Elsevier (2019.3)

■ U Virginia, U North Carolina Chapel Hill, U Minnesota, Duke U, Iowa State, U Washington, U Massachusetts Amherst
  ➢ Declare voice of support to the effort of University of California for new publishing agreement with Elsevier and its walk away. (2019.5)

■ Carnegie Mellon University
  ➢ Strikes PAR deal with Elsevier (2019.11)

■ Iowa State University
  ➢ Strikes PAR deal with OUP (2019.12)
11 European research funders demand immediate OA...the Plan S of cOAlition S

- Declaring that publicly-funded research outputs from respective funders must be published OA immediately after 2020.
  - Articles can only be published on compliant OA journals or platforms. Hybrid journals are explicitly excluded.
  - Aiming to transform hybrid and subscription journals to OA journals.

- Supporting funders
  - Austria, France, Ireland, Italy, Luxembourg, Netherland, Norway, Poland, Slovenia, Sweden, UK
  - Remaining 18 European funders also expected to participate

Source: cOAlition S (2018.9.4)
https://www.scienceeurope.org/coalition-s/
Plan S compliant publication roads

A) OA journal

B) Subscription journal – non OA
- Without embargo period

C) Hybrid journal
- The journals must agree on transformative agreement and must become full OA journal within three years

(c)OAlition S, “Principles and Implementation” (2019.5.30)
https://www.coalition-s.org/principles-and-implementation/
# Academic journals by the type of OA

## Proportion of journals published 2016

<table>
<thead>
<tr>
<th></th>
<th>Subscription only</th>
<th>Delayed OA</th>
<th>Open-access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscription Journals (non-OA)</td>
<td>37.7%</td>
<td>2.2%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Hybrid Journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA Journals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*From Scopus database. Hybrid journals are subscription titles that allow authors to make individual papers open for a fee.

*The hybrid journals allow double-dipping through subscription and APC!*

Source: Nature, “Radical open-access plan could spell end to journal subscriptions” (2018.9.4)
https://www.nature.com/articles/d41586-018-06178-7
Various reactions towards Plan S (1)

- Researchers...protest!
  - Violation of academic freedom!

- Publishers...protest!
  - We are running out of business!

- OA repositories...comment
  - Include also APC-free OA platforms!
  - Position OA repositories as regular road
  - Soften the technical requirements for OA repositories
the need to eliminate the use of journal-based metrics, such as Journal Impact Factors, in funding, appointment, and promotion considerations;
Publishers positive for transformative agreement (TfA)

- Some publishers are positive for TfA
  - Strategy to lock in authors by transforming to OAJ at early stage?

- TfA mostly at country-level
  - Country: Austria, Germany, Netherland, Norway, Switzerland, Hungary, Greek, Slovenia, Spain
  - Institution: Max Planck, Delft University of Technology, California Digital Library, Iowa State University
## Registry for transformative agreement

### Agreement Registry

<table>
<thead>
<tr>
<th>Publisher</th>
<th>Country</th>
<th>Customer</th>
<th>Size (# annual publications)</th>
<th>Start Date</th>
<th>End Date</th>
<th>Details/ ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiley</td>
<td>Germany</td>
<td>Projekt DEAL/MPDL</td>
<td>9500</td>
<td>01/01/2019</td>
<td>12/31/2021</td>
<td>wiley2019deal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Services GmbH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elsevier</td>
<td>Netherlands</td>
<td>VSNU-UKB</td>
<td>4500</td>
<td>01/01/2016</td>
<td>06/30/2019</td>
<td>els2016vsnu</td>
</tr>
<tr>
<td>Wiley</td>
<td>Netherlands</td>
<td>VSNU-UKB</td>
<td>2400</td>
<td>01/01/2016</td>
<td>12/31/2019</td>
<td>wiley2016vsnu</td>
</tr>
<tr>
<td>Elsevier</td>
<td>Norway</td>
<td>Unit</td>
<td>2100</td>
<td>01/01/2019</td>
<td>06/30/2020</td>
<td>elsa2019unit</td>
</tr>
<tr>
<td>Springer</td>
<td>Netherlands</td>
<td>VSNU-UKB</td>
<td>2100</td>
<td>01/01/2018</td>
<td>12/31/2020</td>
<td>sc2018vsnu</td>
</tr>
<tr>
<td>&amp; Francis</td>
<td>Sweden</td>
<td>Bibsam consortium</td>
<td>1700</td>
<td>01/01/2018</td>
<td>12/31/2020</td>
<td>tf2018bibsam</td>
</tr>
<tr>
<td>Akadémiai</td>
<td>Hungary</td>
<td>EISZ</td>
<td>1500</td>
<td>01/01/2019</td>
<td>12/31/2020</td>
<td>kia2019eisz</td>
</tr>
<tr>
<td>&amp; Francis</td>
<td>Netherlands</td>
<td>VSNU-UKB</td>
<td>950</td>
<td>01/01/2018</td>
<td>12/31/2020</td>
<td>tf2018vsnu</td>
</tr>
</tbody>
</table>

Source: ESAC, "Transformative Agreement, Agreement Registry" [https://esac-initiative.org/](https://esac-initiative.org/)

Plan S recommended
Various reactions towards Plan S...Funding agencies (2)

- European countries increases
  - 11->21 agencies

- China joins (?)
  - Big player!

- Zambia, Jordan joins
  - Plan S deal for developing countries

- US
  - Doesn’t join!
5. Impact of Plan S: Need for institutional APC support system
Rise in publication in OAJs and total APCs paid in Japan

Number of Japanese publication extracted from Web of Science by using CU=Japan DocumentType=Article within “DOAJ gold” and “Other gold.”

Publication includes also papers with Japanese author as co-author and not firs author.
How many articles can you publish with average APC US$1000-2000?

Source: Open Science, "How Much Do Top Publishers Charge for Open Access?" (2017.4.20)
The annual research budget of a Japanese researcher (FY2015)

If more than half of Japanese researchers rely on less than $4000 (50万円) for annual research budget, the strong reliance on APCs $1000-2000 can be damaging for number of research outputs.

Source: 第8期研究費部会(第8回) 配付資料「個人研究費等の実態に関するアンケート」について(調査結果の概要)」
Compact for Open-Access Publishing Equity (COPE) – University subsidizes APCs

**THE COMPACT FOR OPEN-ACCESS PUBLISHING EQUITY**

We the undersigned universities recognize the crucial value of the services provided by scholarly publishers, the desirability of open access to the scholarly literature, and the need for a stable source of funding for publishers who choose to provide open access to their journals’ contents. These universities and funding agencies receiving the benefits of publisher services should recognize their collective and individual responsibility for that funding, and this recognition should be ongoing and public so that publishers can rely on it as a condition for their continuing operation.

Therefore, each of the undersigned universities commits to the timely establishment of durable mechanisms for underwriting reasonable publication charges for articles written by its faculty and published in fee-based open access journals and for which other institutions would not be expected to provide funds. We encourage other universities and research funding agencies to join us in this commitment, to provide a sufficient and sustainable funding basis for open access publication of the scholarly literature.

**COPE Signatories**

- Cornell University
- Dartmouth College
- Harvard University
- MIT
- UC Berkeley
- University of Ottawa
- Columbia University
- Memorial Sloan-Kettering Cancer Center
- Universitat de Barcelona
- Duke University
- University of Calgary
- Simon Fraser University
- CERN
- Karlsruhe Institute of Technology
- University of Utah
- University of Pittsburgh
- University of Tennessee
- Texas A&M University
- Emory University
- University of Rhode Island

**COPE compatible OA funds**

- Brandeis Univ
- Carnegie Mellon Univ
- Colorado State Univ
- ETH Zurich
- George Mason Univ
- Indiana Univ-Purdue Univ Indianapolis
- Johns Hopkins Univ
- Lund Univ
- Northern Illinois Univ
- Southern Illinois Univ Carbondale
- Tufts Univ
- Univ of Bielefeld
- Univ of California, Davis
- Univ of California, Irvine
- Univ of California, Merced
- Univ of California, San Diego
- Univ of California, San Francisco
- Univ of California, Santa Barbara
- Univ of California, Santa Cruz
- Univ of Colorado
- Univ of Florida
- Univ of Illinois at Chicago
- Univ of Iowa
- Univ of Kansas
- Univ of Manitoba
- Univ of Minnesota
- Univ of North Carolina at Chapel Hill
- Univ of North Carolina at Charlotte
- Univ of Oklahoma
- Univ of Oregon
- Univ of Tromsø
- Univ of Wisconsin - Madison

Source: Compact for Open-Access Publishing Equity
http://www.oacompact.org/

No signatories renewed after 2014
OA block grant by UKRI

- OA block grant provided by UKRI to universities, and redistributed to researchers by university.

OA block grant provided in FY 2016/17

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Full OA</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block grant provided</td>
<td>£14M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of APC-funded articles</td>
<td>10,000</td>
<td>2500</td>
<td>7500</td>
</tr>
<tr>
<td>Average APC</td>
<td>£1988</td>
<td>£1654</td>
<td>£2101</td>
</tr>
<tr>
<td>Total APCs provided</td>
<td>£18M</td>
<td>£4M *</td>
<td>£16M *</td>
</tr>
</tbody>
</table>

Source: RCUK Open Access Block Grant analysis August 2013—July 2017

Top 10 UK universities by OA block grant provided

<table>
<thead>
<tr>
<th>University</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCL</td>
<td>2.4億円 (£1.63M)</td>
</tr>
<tr>
<td>Cambridge U</td>
<td>1.9億円 (£1.27M)</td>
</tr>
<tr>
<td>Manchester U</td>
<td>1.6億円 (£1.08M)</td>
</tr>
<tr>
<td>Oxford U</td>
<td>1.3億円 (£0.91M)</td>
</tr>
<tr>
<td>Edinburgh U</td>
<td>1.3億円 (£0.98M)</td>
</tr>
<tr>
<td>Sheffield U</td>
<td>0.9億円 (£0.62M)</td>
</tr>
<tr>
<td>Glasgow U</td>
<td>0.9億円 (£0.61M)</td>
</tr>
<tr>
<td>Warwick U</td>
<td>0.7億円 (£0.50M)</td>
</tr>
<tr>
<td>Leeds U</td>
<td>0.7億円 (£0.48M)</td>
</tr>
<tr>
<td>Bristol U</td>
<td>0.7億円 (£0.48M)</td>
</tr>
</tbody>
</table>

Since 30% are OA, Japan will need 9 billion yen for such block grant.
“APCs one of reasons of research strength decline in Japan”

Juichi YAMAGIWA
- President, Kyoto University (2014–)
- President, Science Council of Japan (2017–)
- Former President, Japan Association of National Universities (2017–19)
How to establish funding schema for APCs

1. Turning subscription budget to APCs
   - For many universities, the subscription budget is bigger than the total APCs spent. Thus, this is feasible.
   - However, for transitional period, some additional budget for APCs may be needed.
   - Also, for big research-intensive universities which produce many articles, turning subscription to APCs is not enough.

2. Acquiring grants from funding agencies
   - Funders could provide grants based on research grants allocated or number of published articles.
   - Funders could also support bigger research universities which need excess money for the many research publications.
APC flow

Publisher

Subscription

Library

APC  mil $

Researcher

mil $
Comparing total APCs and subscription for JUSTICE universities

- Analyzed for 300 JUSTICE Japanese universities
- a) Total APCs = publication no × EUR2,000 × 141.85 (2014 rate)
- b) Subscription cost from JUSTICE survey
- a>b = 39 universities
Scenarios of contract amount

Price rise expected at transition phase

Access to publication through subscription

Full OA

Hope for best

Contract amount

OA ratio

Subscription-based contract

Publish & Read contract

Publishing contract (Only APCs are paid)
6. Need for non-commercial Publishing Platforms
The transformation of acad. journals by state of OA

<table>
<thead>
<tr>
<th>Year</th>
<th>Subscription only</th>
<th>Delayed OA</th>
<th>Open-access</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Subscription journal</td>
<td>Hybrid journal</td>
<td>OAJ</td>
</tr>
<tr>
<td></td>
<td>37.7%</td>
<td>2.2%</td>
<td>15.2%</td>
</tr>
</tbody>
</table>

- **2016**
  - Subscription journal: 37.7%
  - Delayed OA: 2.2%
  - Open-access (OAJ): 15.2%

- **Plan S takes effect & TfA period ends**
  - Jap. article OA rate 30%
  - $30 mil APC

- **2024**
  - Subscription journal
  - OA journal

- **50 yrs after**
  - OA journal

- **Jap. article OA rate**
  - 30% in 2016
  - 60% in 2024
  - 100% after 50 yrs

- **APC**
  - 100% flowing out of country
How many acad. contents, i.e. APCs, can we keep in Japan?

If articles are published 100% in overseas OAJs

OA journals with APCs

Let’s use Jap. OA platforms!

If certain portion of contents can be published in Japan

APC-free OA platforms

APC 100% flowing out of country

OA journals with APCs

Repositories, JAIRO Cloud

Let’s use Jap. OA platforms!
Governmental agencies providing publishing platforms

- J-Stage
  - An electronic journal platform for science and technology information in Japan, developed and managed by the Japan Science and Technology Agency (JST).

- SciELO
  - An electronic library covering a selected collection of Brazilian scientific journals.
WEKO3

• Current System WEKO2
  • Journal Article Repository
  • Add Functions more and more

Research Data Handling

• New System WEKO3
  • Based on Invenio3 which is originally focused as Data Repository
  • Integrate WEKO2 Functions into Invenio3

Realize New Publication Platform based on sophisticated Invenio3 Architecture
(Invenio3 = our RDM Platform in Architecture)

- Effective Development and Operation
- Domain Use-case by Extensibility

Number of Repository in Japan
829 IRs
NII Repository Cloud Service
On-Premise

Data Repository
INVENIO

Strengthen Conventional Functions
Next Generation Repositories proposed by COAR

Current repositories

- Services we can develop with repositories today

Next generation repositories

- Services we can develop with the next generation of repositories

Contents does not need to be on the same platform as the publishing arm.

COAR, “Next Generation Repositories”
https://www.coar-repositories.org/activities/advocacy-leadership/working-group-next-generation-repositories/
Proposal) EU provides the e-infrastructure where articles can be submitted, peer-reviewed, published, made available OA.

European Open Access Platform
OA Models without APCs

...Crowd Funding by Libraries

- Library consortium pools money from member organizations and publish journals and monographs.
- OA publishing model without authors paying for APCs.
Private funders demanding immediate OA publication
A gold OA framework in High-Energy Physics...Supporting APCs institutionally and achieve full-OA—SCOAP³

SCOAP³ Journals

- Acta Physica Polonica B (APPB)
- Advances in High Energy Physics (AHEP)
- Chinese Physics C (CPC)
- The European Physical Journal C (EPJC)
- The Journal of High Energy Physics (JHEP)
- Nuclear Physics B (NPB)
- Physics Letters B (PLB)
- Physical Review C (PRC)
- Physical Review D (PRD)
- Physical Review Letters (PRL)
- Progress of Theoretical and Experimental Physics (PTEP)

Source: SCOAP³, "Journals, 2017-2019"
https://scoap3.org/phase2-journals/

Source: SCOAP³日本からの参加機関
https://www.nii.ac.jp/sparc/scoap3/#4

- Coordinated by CERN
- 3000 institutions at 44 countries participating
- 67 Japanese institutions participating (2018)
Cornell U is the host and funds US$175k annually.

Simon Foundation commits US$100k annually.

University libraries across the world contribute membership fees based on its tier.

Tier | Fee
--- | ---
Tier 1: 1–25 | $4,400
Tier 2: 26–50 | $3,800
Tier 3: 51–100 | $3,200
Tier 4: 101–150 | $2,500
Tier 5: 151–200 | $1,800
Tier 6: 201+ | $1,000

Preprint servers on rise!

Source: Open Science Monitor, “Number of preprints”
https://public.tableau.com/profile/sarah.parks#!/vizhome/OApreprints/Dashboard1

※ 2016年にElsevierが買収

COSのOSFがホストするサーバ
Jussieu Call for Open science and bibliodiversity

Promote a scientific publishing open-access model fostering bibliodiversity and innovation without involving the exclusive transfer of journal subscription monies to APC payments.

https://jussieucall.org/jussieu-call/
Changing business from Publisher to Platform Provider for Research Support!

Source: Acquired from Dr. Anders Karlsson, Vice President, Strategic Alliances, Global Academic Relations, Elsevier-Japan, Nov. 2016
The M&As of Elsevier

There is no escape from Elsevier!
The publishers are controlling research!
We are providing excellent research environment!

Research Workflow:
- Review
- Research Grant
- Experiment, Analysis
- Research Output
- Writing Papers
- Submission
- Publish
- Outreach
- Evaluation

Services:
- Scopus (Bibliographic DB)
- Engineering Village (Bibliographic DB)
- Mendeley (Reference Manager)
- Knovel (Workflow Tool)
- hivebench (E-Notebook)
- Mendeley Data platform (Research Data Management)
- WebShop (Support Service for Writing Papers)
- SSRN (Preprint Server)
- ScienceDirect (Publication Platform)
- bepress Digital Commons (Institutional Repository)
- bepress Digital Commons (Institutional Repositories)
- SciVal (Research Evaluation)
- Plum Analytics (Research Strength Analysis)
- Pure (Research Profiling)

(Publisher) Platformer
Researcher
7. Negative effects of ScholCom on scholarship
Proper research assessment leading to proper advancement of scholarship

Peer-review and citation

Excellent Research

Positive incentive system in research and researcher assessments

Excellent Researcher

Hiring and promotion of researcher
ScholCom modes affecting scholarship

- Not only are high subscription cost and APCs affecting research activities.

- The growth in publication number, the over-reliance on quantitative indices are pushing the so-called “publish or perish” mode,

- resulting in salami-slicing of research, predatory journals, research frauds and reproducibility crisis.
Growth in Publications

S&E articles, by selected region, country, or economy: 2003–16

Publication

Intl. co-authored publication

EU

米国

中国

他の途上国

他の先進国

日本

インド

出典: 科学研究のベンチマーク2015
科学技术・学術政策研究所, 調査資料-239, 2015年公表

NSF, National Science & Engineering Indicators 2018

85
World University Rankings
putting quantitative pressure
on universities

The World University Rankings 2019: top 10

<table>
<thead>
<tr>
<th>Rank</th>
<th>2019 Rank</th>
<th>University</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>University of Oxford</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>University of Cambridge</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Stanford University</td>
<td>United States</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>Massachusetts Institute of Technology</td>
<td>United States</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>California Institute of Technology</td>
<td>United States</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Harvard University</td>
<td>United States</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Princeton University</td>
<td>United States</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>Yale University</td>
<td>United States</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>Imperial College London</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>University of Chicago</td>
<td>United States</td>
</tr>
</tbody>
</table>

2019年6月20日

世界大学ランキング2020、日本の大学は半数以上が順位上昇

奎斯夸雷利・桑蒙德斯社（QS社、ロンドン）は19日、「第16回QS世界大学ランキング2020」を発表した。それによるとランキングした日本の41大学のうち、半数以上の24校が順位を落とした。

また、研究パフォーマンスにおける上位100位以内に、初めて日本の大学が入らなかった。高等教育センターや国際化に向けた日本の大学の試みは、同ランキングの結果として、その成果を表すには至っていないことが分かった。

高等教育のグローバルコンサルティング企業QS社が作成する同ランキングは、世界の大学の上位1000位までを掲載したもので、マサチューセッツ工科大学（米国）は8年連続で世界1位という新記録を樹立した。

日本の大学を見ると、上位は東京大学で23位から22位へと過去最高の順位に上げている。東大は4年連続で順位を上げており、31位だった2015年に比べるとランク上昇。

東大は、QS社のAcademic Reputation（学術評判）指標で100/100の満点を獲得。Academic Reputationで満点を達成した世界の8校のうちの1つで、アジアでは唯一。引き続き、世界でも高い評価を得ている学術機関のひとつとして認知されている。
Research Competitiveness measured by publication number

Calculated by National Institute of Science and Technology Policy (NISTEP) using Web of Science data
Web of Science calculating citation indices

Someya, T.

- Total publications: 1,099
- h-index: 76
- Total citations: 31,817
- Total cited by: 22,882

Yearly citations:

- 2000-2019
Publish or Perish

Break in publication leads to unemployment!
Reviewer Fatigue especially in English-speaking countries

The Retraction Watch Leaderboard

Who has the most retractions? Here's our unofficial list (see notes on methodology), which we'll update as more information comes to light:

1. Yoshitaka Fujii (total retractions: 183) See also: Final report of investigating committee, our reporting, additional coverage
2. Joachim Boldt (97) See also: Editors-in-chief statement, our coverage
3. Yoshihiro Sato (87) See also: our coverage
4. Jun Iwamoto (69) See also: our coverage
5. Diederik Stapel (58) See also: our coverage
6. Yuhji Saitoh (53) See also: our coverage
7. Adrian Maxim (48) See also: our coverage
8. Chen-Yuan (Peter) Chen (43) See also: SAGE, our coverage
9. Fazlul Sarkar (41) See also: our coverage
10. Hua Zhong (41) See also: journal notice
11. Shigeaki Kato (40) See also: our coverage
12. James Hunton (37) See also: our coverage
13. Hyung-In Moon (35) See also: our coverage
14. Naoki Mori (32) See also: our coverage
15. Jan Hendrik Schön (32) See also: our coverage
Reproducibility Project: Psychology

Source: Nature, “Over half of psychology studies fail reproducibility test” (2015.9.27)
https://www.nature.com/news/over-half-of-psychology-studies-fail-reproducibility-test-1.18248
Predatory Journals using the OA journal business models

Please pay attention to Predatory...

...Thousands of scientists publishing in pseudo-scientific journals!
Over-reliance on quantitative metrics leading to low quality research

Peer-review and citation

Mass Production of research

Negative incentive system in research and researcher assessments

Excellent Researcher?!

Hiring and promotion of researcher
8. Various attempts to change Research assessments
Leiden Manifesto for Research Metrics

As research evaluation has become routine, the procedures that were designed to increase the quality of research are now threatening to damage the scientific system. The Leiden Manifesto proposes 10 principles for the measurement of research metrics.

1. Quantitative evaluation should support qualitative, expert assessment.
2. Measure performance against the research missions of the institution, group or researcher.
3. Protect excellence in locally relevant research.
4. Keep data collection and analytical processes open, transparent and simple.
5. Allow those evaluated to verify data and analysis.
6. Account for variation by field in publication and citation practices.
7. Base assessment of individual researchers on a qualitative judgement of their portfolio.
8. Avoid misplaced concreteness and false precision.
9. Recognize the systemic effects of assessment and indicators.
10. Scrutinize indicators regularly and update them.

Source: Leiden Manifesto for Research Metrics
http://www.leidenmanifesto.org/
San Francisco Declaration on Research Assessment (DORA)

Improving how research is assessed
Join the organizations and individuals who have signed the Declaration on Research Assessment.

- the need to eliminate the use of journal-based metrics, such as Journal Impact Factors, in funding, appointment, and promotion considerations;

Source: San Francisco Declaration on Research Assessment (DORA)
https://sfdora.org/
Changing Scholarly Communication
...Peer Review System

- **Open Peer Review**
  - Reviewer’s comments are open to public with/without the name of reviewer
  - Enabling transparent peer review

- **Post Publication Peer Review**
  - Peer review done after publishing
  - Speeding up publishing, and allowing to count impact in peer review

- **Cascading Peer Review**
  - Peer review comments transferred to next submission
  - Reducing costs and improving efficiencies in peer review

- It takes too long until published!
- Too many paper to review!
- Do the reviewers really understand my work?
Registered Reports peer reviewing the design of study

- “Registered Reports eliminates the bias against negative results in publishing because the results are not known at the time of review.”
- "Because the study is accepted in advance, the incentives for authors change from producing the most beautiful story to the most accurate one."

(出典) Center for Open Science (COS), “Registered Reports”
https://cos.io/rr/
The Joint Data Archiving Policy (JDAP) describes a requirement that data supporting publications be publicly available.

[Journal] requires, as a condition for publication, that data supporting the results in the paper should be archived in an appropriate public archive, such as [list of approved archives here]. Data are important products of the scientific enterprise, and they should be preserved and usable for decades in the future. Authors may elect to have the data publicly available at time of publication, or, if the technology of the archive allows, may opt to embargo access to the data for a period up to a year after publication. Exceptions may be granted at the discretion of the editor, especially for sensitive information such as human subject data or the location of endangered species.
Asking for evidence data for peer-review
...Peer Reviewers’ Openness Initiative

We will not offer comprehensive review for, nor recommend the publication of, any manuscript that does not meet the following minimum requirements."

1. Data should be made publicly available.
2. Stimuli and materials should be made publicly available.
3. In case some data or materials are not open, clear reasons (e.g., legal, ethical constraints, or severe impracticality) should be given why.
4. Documents containing details for interpreting any files or code, and how to compile and run any software programs should be made available with the above items.
5. The location of all of these files should be advertised in the manuscript, and all files should be hosted by a reliable third party.

(出典) Peer Reviewers’ Openness Initiative
https://opennessinitiative.org/the-initiative/
Data Journals and Supplemental Data

- **Data journals established (2014-)**
  - **Nature:** Scientific Data
    - *Scientific Data* is an open-access, online-only journal for descriptions of scientifically valuable datasets.
  - **Elsevier:** Data in Brief
    - *Data in Brief* provides a way for researchers to easily share and reuse each other's datasets by publishing data articles.

- **Supplemental Data**
  - Supporting material that cannot be included, and which is not essential for inclusion, in the full text of the manuscript, but would nevertheless benefit the reader.

OA gains more citations!

Open access papers ‘gain more traffic and citations’

Open access science articles are read and cited more often than articles available only to subscribers, a study has suggested.

July 30, 2014

The Research Information Network analysed the web traffic to more than 700 articles published in hybrid science journal Nature Communications in the first six months of 2013.

It found that, after 180 days, articles whose authors had paid for them to be made open access had been viewed more than twice as often as those articles accessible only to the journal’s subscribers.

A further analysis of more than 2,000 papers published in Nature Communications between April 2010 and June 2013 revealed that open access articles were cited a median of 11 times, compared with a median of seven citations for subscription-only articles. The paper concludes that open access papers enjoy a “small” citation advantage in all disciplines except chemistry.

APC-IF-OA-research budget considered to determine publication venue in life sciences

Which journal is a bargain?

Let’s invite someone as co-author who has funds for APC
Factors affecting publication venue in OA age

- Journal impact factor?
- Whether journal is OA
- Amount of APC
- Swiftness of publication
- Swiftness of user comments

※ Publishing first on a preprint server proves to be most effective!
Assessing social impact of academic research

☐ **UK-REF** (Research Excellence Framework)
  - Research assessment framework for UK universities.
  - Compared to its successor RAE, it assesses impact of research outside the academy.

☐ **Altmetrics**
  - Alternate bibliographics using impact on social media, views, downloads in contrast to traditional bibliometrics using citations, h-index, and IFs.

小林直人他「英国の新たな大学研究評価 REF におけるインパクトの分析」
https://www.jstage.jst.go.jp/article/randi/30/0/30_154/_pdf

http://altmetrics.org/manifesto/
Research assessment in the digital age

...Excellent research vs Soundness of science

- In the print age, only excellent articles could be accepted because of physical constraints.
- In the digital age, e-journals can include all articles which is soundly performed.

Soundness of science

<table>
<thead>
<tr>
<th></th>
<th>E-journal (mega journal)</th>
<th>Print journal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication no</td>
<td>infinite</td>
<td>finite</td>
</tr>
<tr>
<td>Peer-review method</td>
<td>Able to include “sound science”</td>
<td>excellence</td>
</tr>
<tr>
<td>Peer-reviewed materials</td>
<td>Article and supplements (data, code, etc.)</td>
<td>Only text-based article</td>
</tr>
<tr>
<td>Advantage</td>
<td>➢ Include negative results ➢ Eliminate research bias ➢ Preserve research in detail</td>
<td>➢ filtering ➢ Less articles to read</td>
</tr>
</tbody>
</table>
8. Concluding Remarks
Remarks for S&T policymakers (1)

... ScholCom Affordability issue

- ScholCom has great impact on how scholarship prospers, as ScholCom is the embodiment of scholarship.
- Thus, defect in the circulation of academic contents, whether seen from publication or reading side, severely impacts the research competitiveness of country.
- Supporting subscription or APCs relieves the situation; however, it is not the final solution as it will lead only to additional revenue flow for commercial publishers.
- If we cannot stop commercial publishers from upheaving the price, we need to think of alternate solution outside the private sector.
Remarks for S&T policymakers (2)

... Deteriorated research issue

- ScholCom is also closely tied to research assessment as research is assessed through the circulated contents.
- The tremendous growth in publications and the overemphasis in quantitative metrics have led to the “publish or perish” mode.
- This in turn has led to salami slicing of research, research frauds, reproducibility crisis, diverting researchers from quality research.
- Research is only meaningful if it is quality research! Something has to be done to stop the chase for high numbers!
Remarks for S&T policymakers (3)

...Defining research and assessment fit for 21st century

- There has been attempts to innovate research assessment methods to reduce negative effects of research assessment onto research.
- The digital age has also enabled faster circulation, inclusion of “sound science,” and data and codes as research outputs.
- These are trying to change assessment to change research. However, as of principle, change in research assessment should come after, or at least together with, the change in research!
- Additionally, research and its assessment should be innovated by people who do the research and not by ScholCom or policymakers.
The push and resisting force towards Open Science

Way to do Research

The degree of Open Science is determined by the balance of two forces.

- Accountability
- Avoid duplicate investment
- Digital Technology
- Data Deluge
- Acceleration of Research
- Inter-disciplinary Research
- Research Reproducibility
- Research Transparency
- Excess in Research Output
- Transformation of Scholarly Communication System

Open Science?

Traditional Scholarship

Intl. Competitiveness

Researcher Career

HR Skills

Data Protection
Remarks for S&T policymakers (4)

...Research in 21st century

- The research in 21st century is thought to be
  - With societal impact and addressing social issues
  - Inter-, multi-, cross-, trans-disciplinary
  - Inclusive and collaborative within and outside academy
  - Enabled by digital platforms for information sharing, collaboration, and openness.

- Suitable ScholCom will be
  - Inclusion of all “sound science” outputs to enable interdisciplinary science
  - Inclusion of research outputs outside academic articles (blogs, reports, initiatives, forming of groups etc.)
  - Inclusion of various digital outputs (data, DB, code, platforms, blogs, threads, etc.)
  - Inclusion of society in the communication
Remarks for S&T policymakers (4)

...Research Assessment in 21st century

- Suitable research assessment would be
  - Including societal aspects and values
  - Including research outputs outside academic articles (blogs, reports, initiatives, forming of groups etc.)
  - Including various digital outputs (data, DB, code, platforms, blogs, threads, etc.)
  - Including citizens and society

Scientists, government, citizens, industry, NPOs...
Declaration on Science and the Use of Scientific Knowledge

Adopted by
- World Conference on Science
- Budapest, Hungary, 1st July, 1999

Considering
- where the natural sciences stand today and where they are heading, what their social impact has been and what society expects from them, …
- the need for a strong commitment to science on the part of governments, civil society and the productive sector, as well as an equally strong commitment of scientists to the well-being of society,

Proclaim the following:

1. Science for knowledge; knowledge for progress
2. Science for peace
3. Science for development
4. Science in society and science for society

http://www.unesco.org/science/wcs/eng/declaration_e.htm