Challenges in establishing a research culture that supports research excellence

Professor Mai Har SHAM
The University of Hong Kong

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Outline

- Research Incentive systems for research excellence
  - Perspectives of researchers
  - Perspectives of institutions
- What are the problems with the current systems
- Ingredients in a supportive research culture for quality research
Performance indicators for researchers

Research Grant Income

Research Output

Quantity and Quality of Publications
Current publication incentive system

Bibliometric Incentives

The current incentive structure values publications of significant results and citations. Publications that are not highly cited are viewed as scientific failures and wasted resources.

Wasted resources, failure

Employment, promotion, increased pay, funding, prestige, success

High impact publications: the Key to success

- Job
- Promotion and tenure
- Awards:
  - Outstanding Publication Awards
  - Outstanding Researcher Awards
- Research grant awards
- (International) recognition
## Publish or Impoverish

<table>
<thead>
<tr>
<th>Table V. Comparison of average amount of cash awards$^a$ for a paper published in selected journals (2008-2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature, Science</td>
</tr>
<tr>
<td>PLOS One</td>
</tr>
<tr>
<td>MIS Quarterly</td>
</tr>
<tr>
<td>JASIST</td>
</tr>
<tr>
<td>Journal of Documentation</td>
</tr>
<tr>
<td>Library Hi Tech</td>
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<tr>
<td>LIBRI</td>
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</tbody>
</table>

**Note:** $^a$All the amounts are full amount (in USD) awarded to the first author

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Research investment and outputs in China

Figure 1.
Research inputs and outputs in China (1995-2013)

Publish or Impoverish

Cash reward for books and peer-reviewed articles; to be shared between university central administration, faculty/department, and the researcher
– South Africa Department of Higher Education and Training (DHET)

Payouts push professors towards predatory journals

If South Africa truly wants to encourage good research, it must stop paying academics by the paper, says David William Hedding.

Selective reporting leads to distorted record

<table>
<thead>
<tr>
<th>Incentives and Standards of Practice</th>
<th>Publication Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong> Current bibliometrics incentive structure results in publication of high rates of false positives and very few negative results</td>
<td>False Positive</td>
</tr>
<tr>
<td></td>
<td>True Negative</td>
</tr>
<tr>
<td><strong>B.</strong> The rigor and reproducibility initiative will increase True Positives but existing incentive structure will still discourage publication of negative results. This will discourage innovative studies and replications</td>
<td>False Positive</td>
</tr>
<tr>
<td></td>
<td>True Negative</td>
</tr>
<tr>
<td><strong>C.</strong> Incentives added to achieve the optimal balance, perhaps 50:50, between positive and negative results.</td>
<td>False Positive</td>
</tr>
<tr>
<td></td>
<td>True Negative</td>
</tr>
</tbody>
</table>

Prolific publications and questionable practices

- Authorship issues
- Publishing in predatory journals
- Salami publishing
- Selective reporting
- Risks of misconduct and questionable research practices

Quality and Excellence?
Performance indicators for universities

- World Ranking and League Tables
- Research output
  - Publications, citation impact
  - Patents
- Research income
- Awards and distinctions of professors and students
- Reputations
Criteria for World Rankings of Universities

### ARWU Methodology 2017

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Indicator</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Education</td>
<td>Alumni of an institution winning Nobel Prizes and Fields Medals</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Staff of an institution winning Nobel Prizes and Fields Medals</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Highly cited researchers in 21 broad subject categories</td>
<td>20%</td>
</tr>
<tr>
<td>Research Output</td>
<td>Papers published in Nature and Science (not for institutions specialized in humanities and social sciences)</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Papers indexed in Science Citation Index-expanded and Social Science Citation Index</td>
<td>20%</td>
</tr>
<tr>
<td>Per Capita Performance</td>
<td>Per capita academic performance of an institution</td>
<td>10%</td>
</tr>
</tbody>
</table>


### THE World University Rankings Methodology 2016-2017

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Teaching - the learning environment</td>
<td>30%</td>
</tr>
<tr>
<td>Research - volume, income and reputation</td>
<td>30%</td>
</tr>
<tr>
<td>Citations - research influence</td>
<td>30%</td>
</tr>
<tr>
<td>Industry income - innovation</td>
<td>2.5%</td>
</tr>
<tr>
<td>International outlook - staff, students and research</td>
<td>7.5%</td>
</tr>
</tbody>
</table>


### QS World University Rankings

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic reputation from Global Survey</td>
<td>40%</td>
</tr>
<tr>
<td>Employer reputation from Global Survey</td>
<td>10%</td>
</tr>
<tr>
<td>Citations per faculty from Scopus</td>
<td>20%</td>
</tr>
<tr>
<td>Faculty student ratio</td>
<td>20%</td>
</tr>
<tr>
<td>Proportion of international students</td>
<td>5%</td>
</tr>
<tr>
<td>Proportion of international faculty</td>
<td>5%</td>
</tr>
</tbody>
</table>

http://www.iu.qs.com/university-rankings/world-university-rankings/
Research Assessment Exercises

Examples
▶ Excellence in Research for Australia ERA 2018
  • Australian Research Council
▶ Hong Kong Research Assessment Exercise RAE 2020
  • University Grants Committee
▶ UK Research Excellence Framework REF 2021
  • 4 UK Higher Education Funding bodies

Purposes
▶ Encourage world-class research and drive excellence
▶ Review and identify areas of research strengths and opportunities
▶ Develop research strategy
▶ Allocate funding
Grading System in Hong Kong RAE 2020

Elements of assessment:
- Research outputs – 70%
- Impact – 15%
- Environment – 15%

Research outputs will be assessed in terms of their originality, significance and rigour with reference to international standards and graded as:
- 4 ★: world leading
- 3 ★: internationally excellent
- 2 ★: international standing
- 1 ★: of limited originality, significance and rigour
- u/c: unclassified
Research Incentive Systems

Publication assessment score

Publication assessment score

Job, Promotion & tenure prestige Grant & reward

Job, Research reputation funding support
Cultural differences: a matter of taste?
A commonly acceptable assessment?
Problems of relying on metrics

- Research for the purpose of publishing, not for problem solving
- ‘Publish or perish’ for career advancement, ignoring impact on society and community
- Locally-relevant, discipline-relevant issues are undervalued
- PhD students and junior researchers follow suit, perpetuating the behaviour and culture
- Risks of questionable research practices, e.g. salami science, selective reporting, p-hacking, sample size manipulation, reproducibility.....

Poor quality of research!
Challenges in moving away from metrics

Moving away from metrics

The Chinese Academy of Sciences is changing the way it assesses its research. But finding the right balance in such a big organization is a tough job.


- Quantitative measurement of 24 indicators, including number of publications and citations, funds raised, awards gained, patents issues
- Peer review of progress on strategic goals for research institutions
How does high quality research look like?

- Rigorous
- Accurate
- Original
- Honest
- Transparent
- Collaboration
- Multidisciplinarity
- Openness
- Creativity

Responsible research and innovation metrics

Quantitative indicators in the governance, management and assessment of research

▶ Robustness
▶ Humility
▶ Transparency
▶ Diversity
▶ Reflexivity

The Hong Kong Manifesto

- 5 Principles for Assessing Researchers with a focus on Research Integrity
Performance Review @ HKU

Academic Performance Portfolio
– include multi-dimension contributions in research and academic activities

▶ Teaching
– Curriculum development and innovation
– Teaching responsibilities
– Teaching evaluations
– Training of research postgraduate students

▶ Scholarship and Research
– Publications
– Research grants
– Editorship
– Invited lectures

▶ Knowledge Exchange
– Patents, consultancy and contract agreement

▶ Service and Administration
Quality assurance of research

Mechanisms to review and evaluate the processes and conduct of research

- Project planning, documentation of procedures and methods, handling of samples, materials and subjects, research record and data management
- Provision of facilities, equipment and infrastructure support
- Responsible Conduct of Research and research skills training of research staff
Research culture is contributed by ALL

Institution

Collaborators

Grant Agencies

Publishers

Professional Bodies

Ranking Agencies

Government

Industry

Students

Professors
Strategies that make a difference

▶ Institutional and individual levels of responsibility and commitments in promoting trustworthiness of research

▶ Research is performed by individuals who engage in RCR, in an institution that is committed to RCR

▶ Forstering a supportive research environment for best practices and quality research outcome