ICSU
International Council for Science

4th World Conference on Research Integrity WCRI
"Research rewards and integrity: improving systems to promote responsible research"
Rio de Janeiro, Brazil, 31 May – 3 June 2015

Symposium "Research assessment and quality in science: perspectives from international science and policy organisations", organised on 2 June by the ICSU Committee on Freedom and Responsibility in the conduct of Science CFRS

Moderator

- Merry Bullock, member of ICSU CFRS, and Senior Director of the American Psychological Association, Washington, DC

Presentations

- Ellen Hazelkorn, Policy Advisor to the Higher Education Authority in Ireland / Higher Education Policy Research Unit at the Dublin Institute of Technology, Ireland: "Challenges for science and the problems of assessing research"
- Carthage Smith, Global Science Forum at the Organisation for Economic Cooperation and Development OECD, France: "Research assessment and science policy development"
- Robert H. McLaughlin, Manager in the Office of Research Integrity, University of Cape Town, South Africa: "Research integrity in South Africa: the value of procedures and processes to global positioning"
- Tatiana Duque Martins, Global Young Academy GYA / Federal University of Goiás, Brazil: "Rewards, careers and integrity: perspectives of young scientists from around the world"

Summary

Scientific output today is measured and evaluated through tools ranging from publication and citation impact to institutional rankings, also in rapidly developing science systems. The use of such assessment exercises may, however, inadvertently undermine research integrity by shifting emphasis from quality to quantity of research. Despite considerable discussion about the validity of different assessment methods, there has been little evaluation of their impact on research quality and research integrity. A recent international workshop, co-sponsored by the Committee on Freedom and Responsibility in the conduct of Science, highlighted several ways in which science assessments negatively affect research quality and integrity:

- By replacing quality assurance mechanisms, above all peer review, the management tools of citation and impact factors may create a reward system that favours quantity over quality, tempting scientists to use "shortcuts" to achieve high quantity output;
- The use of publication quantity and citation rates as criteria for research funding or academic promotion results in pressure for high volume output, which may incite scientists to augment production through fabrication or republication of data, or plagiarism;
- University rankings add to these pressures on scientists for high quantitative output. Furthermore, they are inherently limited in capturing the full dimensions of scientific work, neglecting less readily quantifiable factors such as relevance and benefit to society.

CFRS views the nexus between science assessments and research integrity as a major emerging issue that demands attention from scientists and science managers. Its proposed symposium addresses the above issues from the different regional perspectives and actors, considering systemic assessment and reward processes that would promote scientific work for the benefit of society and respecting the globally accepted norms of research integrity, for example stipulated in the Singapore Statement of 2010.

Abstracts

Ellen Hazelkorn: Challenges for science and the problems of assessing research in the era of globalisation

Globalisation has transformed the role and importance of university-based research as a driver of knowledge intensive growth. The depth of the global economic crisis, and the pivotal role played by higher education as an "engine of the economy" has led to concerted efforts to effectively harness higher education to the wagon of economic recovery and growth. At the same time, the increasing prominence of global university rankings has had a revolutionising impact on higher education. While science has always operated in an international and competitive environment, rankings have catapulted higher education to the top of the policy agenda and prioritised university-based research arguably undermining the traditional teaching-research nexus. Correspondingly, assessment of publicly funded research is part of a growing trend for greater transparency, accountability and responsibility, with implications for research practice and organisation – and the wider innovation eco-system.

These developments are posing a significant challenge for research, leading to considerable rebalancing in the role of research within higher education and society. In some instances the pressures are contradictory; for example, public pressure is requiring research to have a greater and public and social accountability while rankings tend to emphasise academic accountability via peer review. Overall, there is a discernible tension in science policy between research as being vital for human capital development vs. its contribution to economic development; between an emphasis on researcher curiosity vs. alignment with national priorities; between funding excellence wherever it exists vs. targeting funding to strengthen capability or build scale; and between encouraging new and emerging fields and higher education institutions vs. prioritising existing strengths. These developments are also challenging the way in which research is measured and assessed. Research assessment can play an important role in improving performance and quality, supporting institutional autonomy and strategic planning, differentiating research missions and attracting talent. Many countries have or are in the process of introducing research evaluation processes. Depending upon jurisdiction, concepts of valorisation, impact and relevance now form an important component of the research/science policy discourse, displacing or replacing traditional language around intellectual curiosity, and cultural and political independence from economic forces.

This presentation will review changes in the global landscape of higher education and research, and explore the implications of these changes for research and researchers. As public funding for research declines and international competition accelerates, what are the consequences for research integrity?

Carthage Smith: Research assessment and science policy development

Research assessment and the use of quantitative measures, such as bibliometrics, are increasingly being blamed for various malaises in our research systems, including an increase in the prevalence of research misconduct (falsification, fraud and plagiarism). The reality is that there is a lot of hearsay and anecdote when it comes to asserting the distorting effects of bibliometrics on the research enterprise and there is a shortage of real empirical evidence. Likewise the adulatory terms in which many senior scientists speak of peer review as the 'Gold Standard' for research evaluation have little empirical basis. Both quantitative metrics and subjective peer analyses have their advantages and drawbacks and both have impacts on the way scientists and science systems function. But we do not fully understand what these impacts are and what an appropriate balance between different assessment approaches might be in different situations with different objectives.

OECD is a major provider of data and analysis to inform science and innovation policies in many countries. This includes measures of public and private investment in science that can be broken down across disciplines and sectors. It also includes key output measures for

basic and applied research, including training and education. Bibliometric measures are increasingly used to get an insight into both the quantity and quality research production at the national level and also to explore issues such as international collaboration and researcher mobility. This data is used to benchmark the performance of different countries and assess their development over time. There is increasing policy demand for micro-analysis using bibliometric data at the sub-national or institutional level.

The use of bibliometric measures is an important part of science policy analysis. Used carefully such measures can provide valuable information about how scientists are publishing but they are certainly imperfect measures and, when disproportionate value is attached to them and/or they are used naively they may indeed have negative impacts. The measurement of science should not dictate how it is performed but rather desired performance should dictate what needs to be measured. Hence the question for us all might be what do we consider to be optimal scientific performance (for an individual, an institution or a country)? – I suspect that publication outputs in one form or another will be a critical element of the answer for most of us.

Robert H. McLaughlin: Research integrity in South Africa: the value of procedures and processes to global positioning

The intensity of research activity in South African universities together with the pursuit of non-traditional sources of funding has elevated the need for institutional programming and support of responsible conduct of research in South Africa. The challenge to do so is at least two-fold: 1) global positioning as a matter of rank and prestige depends on research outputs and research ethics commensurate with the standards of leading institutions in “the North”; and 2) global positioning as a peer institution with collaborative scientists and scholars prepared to work in multi-sited, multi-institutional, and multi-disciplinary research depends on common standards and administrative consistency, including increased transparency with research sponsors. South African institutions thus confront authorship, financial and other conflicts of interest, human subjects protection, and animal research ethics with a unique perspective, local procedures and processes. And we ask: Is an African research agenda possible, and what are the contours of ethics and responsible conduct that shape it?

Tatiana Duque Martins: Rewards, careers and integrity: perceptions of young scientists from around the world

Why is integrity not a core criterion in assessment procedures? Given that reward incentives drive behaviour, should that not be the case? Where is the problem? Apparently, the lack of integrity *is* a criterion; scientific fraud is not being accepted. It might come across as puzzling that scientists behave fraudulently, despite this being diametrically opposed to fundamental scientific principles. But if we tolerate some small degree of dishonesty, such an outcome is not at all surprising. Reward systems based on quantity (e.g. bibliometrics), rather than quality, are not suited to reveal integrity issues, and to the contrary, with the exerted pressure, can even foster bad practice. Scientists should be appropriately rewarded for their work, a lack of reward results in poor commitment. With science being a global enterprise, poor reward systems can fuel brain drain. Integrity is part of the quality of scientific work, and should be seen as a *conditio sine qua non*. With this being strictly applied, integrity becomes disqualified as a reward criterion due to lack of differentiation. We however need to scrutinise scientific outputs for integrity. Reviewers of journal articles are to answer the question whether authors have provided sufficient detail for enabling their findings to be reproduced. Integrity goes hand in hand with openness, transparency, and scientific discourse. Young scientists must not be pressured into compromising on integrity for seeing their careers flourishing or led to believe that they better should.