

Contextual innovation and social engagement: From impact factor to impact

AUTHOR:
Tania S. Douglas¹

AFFILIATION:
¹MRC/UCT Medical Imaging
Research Unit and Biomedical
Engineering Programme,
University of Cape Town,
Cape Town, South Africa

CORRESPONDENCE TO:
Tania Douglas

EMAIL:
tania@ieee.org

POSTAL ADDRESS:
MRC/UCT Medical Imaging
Research Unit, Faculty of
Health Sciences, University of
Cape Town, Private Bag X3,
Observatory 7935, South Africa

KEYWORDS:
frugal innovation; university
ranking; academic rewards; NRF
rating; community engagement

HOW TO CITE:
Douglas TS. Contextual
innovation and social
engagement: From impact
factor to impact. *S Afr J Sci.*
2013;109(3/4), Art. #a010, 2
pages. <http://dx.doi.org/10.1590/sajs.2013/a010>

Innovation trends in developing settings

The terms 'frugal innovation'¹ and 'frugal engineering'² have recently been applied to practices that produce contextually appropriate and desirable technologies, especially in emerging countries such as India. Frugal innovation minimises the use of expensive and scarce resources, or leverages them in new ways, resulting in low-cost products and services. It therefore often has a social mission.¹ Frugal innovations are cheap, use local materials, are robust in harsh environments, are easy to use and repair, and are often adaptations of existing technologies to new uses.² Yet they can incorporate cutting edge science and technology.¹ A famous example of a low technology frugal innovation is the Jaipur foot – a cheap, mass-produced rubber prosthesis suitable for uneven terrain and developing country conditions. Higher up on the scale of technological sophistication is a low-cost ultrasound device developed by GE's operations in China specifically for this market. There is also the Tata Nano, promoted as the world's cheapest car, originating in and intended for India. These examples have also found markets elsewhere. Frugal innovation is considered relevant also in developed economies, where it may mitigate escalating costs and revitalise tired innovation processes.^{1,3} It has been characterised as the 'holy grail' of innovation.⁴

A key attribute of frugal innovation is the involvement of end users as co-designers³ – the knowledge of users is tapped to address their needs and ensure contextual suitability. This attribute is a requirement if products and processes are to reach the end of the innovation pipeline (i.e. implementation) and satisfy any developmental objective. 'Contextual' rather than 'frugal' innovation is perhaps preferable, denoting innovation that is inspired by the desire to confront local challenges, and not only by a low cost imperative.

Engagement and the academic reward system

Universities are major contributors to innovation. In fact, innovation is generally considered a pathway through which they contribute to development, fulfilling what is often referred to as their third mission, in addition to the first two of teaching and research. This third mission, while poorly defined, is typically referred to as community engagement⁵, and has been conceptualised as including both social⁶ and economic⁷ development. Scholarly engagement with civil society is vital if South African universities are to innovate for development. Such engagements elicit knowledge and highlight needs to ensure that innovations are meaningful in their target context and are ultimately adopted.

However, the current academic reward system does not promote engagement and research implementation. Despite the inclusion of citizenship and social awareness in undergraduate curricula and the addition of categories such as 'social responsiveness' to promotion criteria, university research remains embedded in a reward system of publication, citation and funding awards – the 'publish or perish' cycle. This cycle involves applying for research grants, carrying out the research, publishing papers, and using these papers to justify more research grants.

One aspect of the academic reward framework and a source of academics' and institutional resistance to leaving 'the ivory tower' and entering the community, resides in international university ranking systems. These enjoy increasing attention, including in South Africa, and influence institutional reputation among university stakeholders. It has been argued that international rankings disadvantage institutions in a country like South Africa, where empowering marginalised citizens and addressing skills shortages are key priorities. These rankings disregard context and disadvantage developmentally oriented models of higher education.⁸ They also do not measure a university's role in contributing to its local social environment.⁹ In conflict with shifts in policy towards Mode 2 knowledge production – which is context driven, problem focused and transdisciplinary – rankings perpetuate the dominance of traditional Mode 1 knowledge production, focusing on disciplinary publication and neglecting impact beyond narrow academic confines.¹⁰

The National Funding Framework, implemented in 2004, allocates funds to higher education institutions in accordance with the quantity of their research outputs – publications in accredited journals and postgraduate degrees. This policy has resulted in increases in publication outputs,¹¹ a sign that it may further be entrenching the existing academic reward framework.

Similarly, the rating system used by the National Research Foundation (NRF) to assess research productivity and scientific impact rewards publication by providing rated researchers with access to (limited) research funding. Universities publicise ratings as a sign of their research standing. The reputational value placed by the rating system on international publications, especially its focus on journals with high impact factors, conditions the behaviour of researchers in the higher education system. The extension of the NRF rating system to social science researchers has been associated with an increase in publication in international journals, in line with the expectations of the rating system.¹² Publication in local social science (and other) journals, however, may be appropriate for research that is of interest to local communities. Yet the rating system perpetuates the norms of overseas ranking and rating schemes and may discourage locally relevant research.¹³

There also is the risk that, under the guise of engagement, exploitative research and teaching practices earn academic rewards but harm vulnerable communities. For example, the phenomenon of developed world universities viewing the developing world as the 'classroom of the 21st century' has been criticised as a new form of colonialism,¹⁴ focusing on universities' philanthropic ambitions rather than on the interests of the target communities.¹⁵ But engagement is not one-sided, and researchers have opportunities to establish close long-term

partnerships with civil society, innovating collaboratively with it, and addressing and responding to its changing needs.¹⁶

An integrated approach

The conflict between the traditional academic reward system on the one hand, and the emphasis on engaged and relevant scholarship, that has an impact on social conditions, on the other hand, is not irreconcilable. Engagement does not only benefit the community. It can also promote research productivity while supporting contextual innovation. It would do this by providing access to an often untapped source of contextualised knowledge, which, when brought to the surface and processed, can contribute to the developmental mission of higher education, while simultaneously enhancing traditional research outputs.

All of this suggests that contextual innovation needs to be more greatly prized and rewarded by South African higher education, not only for its developmental role, but also for its potential to enhance the country's specific contributions to the global academy. To do truly world-class research means conquering the local and theorising these experiences to the global.

Acknowledgements

The author receives support from the Andrew W. Mellon Foundation, the Programme for the Enhancement of Research Capacity at the University of Cape Town, and the Community Engagement Programme of the National Research Foundation.

References

1. Bound K, Thornton I. *Our frugal future: Lessons from India's innovation system*. London: Nesta; 2012.
2. Wood J. *Healthcare in Asia – the innovation imperative*. London: Economist Intelligence Unit; 2011.
3. Howitt P, Darzi A, Yang G, Ashrafian H, Atun R, Barlow J, et al. *Lancet*. 2012;380:507–535. [http://dx.doi.org/10.1016/S0140-6736\(12\)61127-1](http://dx.doi.org/10.1016/S0140-6736(12)61127-1)
4. Prahalad C, Mashelkar R. *Innovation's holy grail*. *Harvard Business Review*. 2010 July/August;132–141.
5. Jongbloed B, Enders J, Salerno C. Higher education and its communities: Interconnections, interdependencies and a research agenda. *High Educ*. 2008;56:303–324. <http://dx.doi.org/10.1007/s10734-008-9128-2>
6. Bernardo M, Butcher J, Howard P. An international comparison of community engagement in higher education. *Int J Educ Dev*. 2012;32:187–192. <http://dx.doi.org/10.1016/j.ijedudev.2011.04.008>
7. Philpott K, Dooley L, O'Reilly C, Lupton G. The entrepreneurial university: Examining the underlying academic tensions. *Technovation*. 2011;31:161–170. <http://dx.doi.org/10.1016/j.technovation.2010.12.003>
8. Habib A. A league apart. *Times Higher Education*. 2011 October 13.
9. Price M. Do university rankings matter? *Mail & Guardian* [online]. 2010 Sep 24 [cited 2012 Feb 18]. Available from: <http://mg.co.za/article/2010-09-24-do-university-rankings-matter>
10. Hazelkorn E. *Rankings and the reshaping of higher education*. Basingstoke: Palgrave Macmillan; 2011. <http://dx.doi.org/10.1057/9780230306394>
11. Pouris A. Scientometric research in South Africa and successful policy instruments. *Scientometrics*. 2012;91:317–325. <http://dx.doi.org/10.1007/s11192-011-0581-9>
12. Inglesi-Lotz R, Pouris A. Scientometric impact assessment of a research policy instrument: The case of rating researchers on scientific outputs in South Africa. *Scientometrics*. 2011;88:747–760. <http://dx.doi.org/10.1007/s11192-011-0440-8>
13. Visser G. On citations, rating games and other pesky animals: Which zoo for South African human geography? *S Afr Geogr J*. 2007;89(2):135–144. <http://dx.doi.org/10.1080/03736245.2007.9713883>
14. Vandersteen JDJ, Baillie CA, Hall KR. International humanitarian engineering: Who benefits and who pays? *IEEE Technology and Society Magazine*. 2009 Winter;32–41. <http://dx.doi.org/10.1109/MTS.2009.934998>
15. Lucena J, Schneider J, Leydens JA. Making the human dimensions of sustainable community development visible to engineers. *Engineering Sustainability*. 2011;164:13–23. <http://dx.doi.org/10.1680/ensu.1000014>
16. Douglas TS. Biomedical engineering education for developing countries. *IEEE Technology and Society Magazine*. 2012 Fall;51–57. <http://dx.doi.org/10.1109/MTS.2012.2211155>

