SEEKING IMPACT AND VISIBILITY
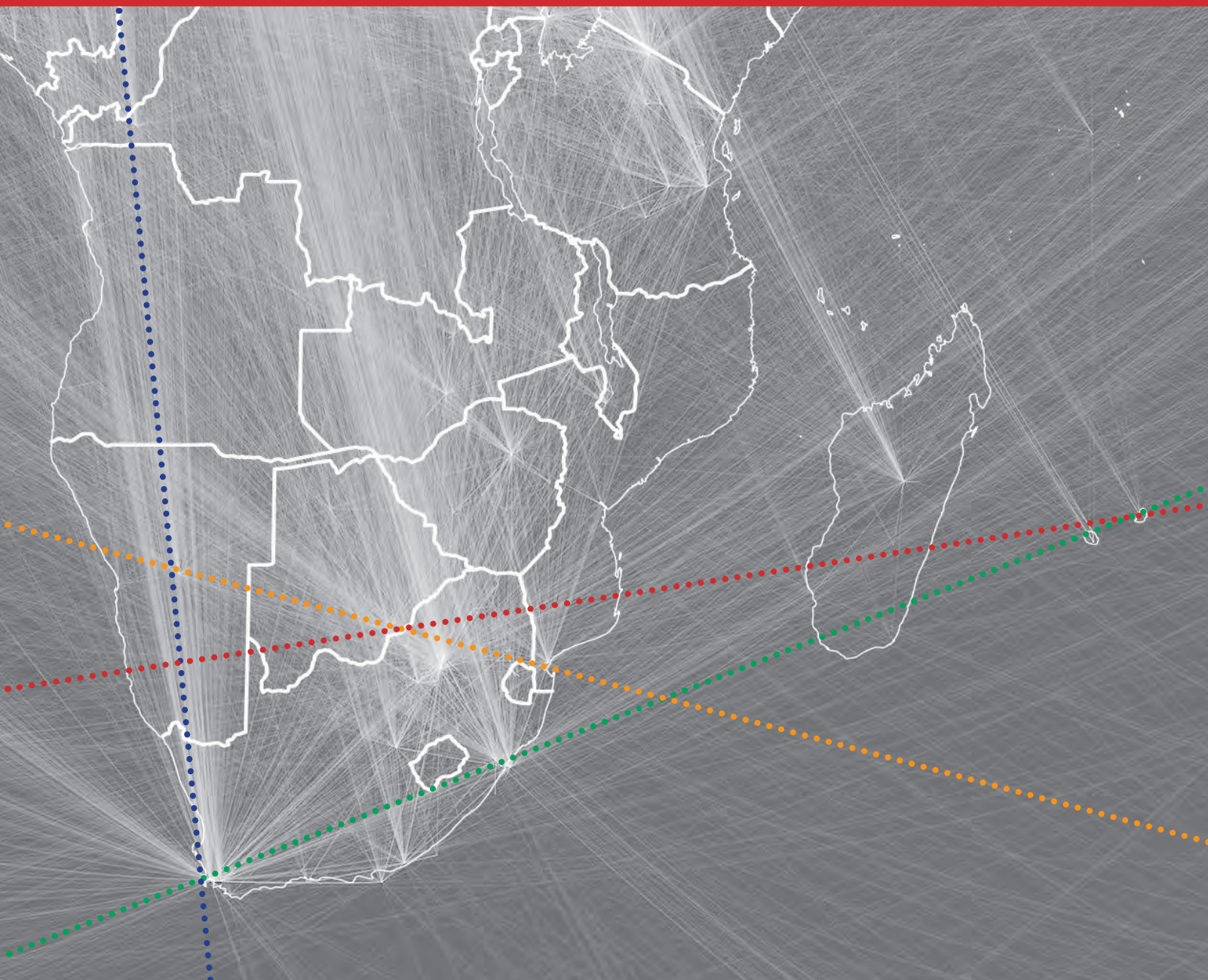
SCHOLARLY COMMUNICATION IN SOUTHERN AFRICA

Henry Trotter, Catherine Kell, Michelle Willmers, Eve Gray & Thomas King

SEEKING IMPACT AND VISIBILITY

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AFRICAN MINDS

SCHOLARLY COMMUNICATION IN AFRICA PROGRAMME

sarua
southern african regional
universities association

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Abbreviations

ADSL	Asymmetric Digital Subscriber Line
ANC	African National Congress (South Africa)
APC	article processing charge
CASR	Centre for Applied Social Research (UoM)
CBBR	Centre for Biomedical and Biomaterials Research (UoM)
CC	content coordinator
CC-BY-SA	Creative Commons (license) – Attribution and Share Alike
CCRC	Consultancy and Contract Research Centre (UoM)
CERN	European Organisation for Nuclear Research
CET	Centre for Educational Technology (UCT)
CHAT	Cultural Historical Activity Theory
CHED	Centre for Higher Education Development (UCT)
CHET	Centre for Higher Education Transformation (South Africa)
CMS	content management system
Comm	Faculty of Commerce (UCT)
CRIS	current research information system
CV	curriculum vitae
DANIDA	Danish International Development Agency
DHET	Department of Higher Education and Training (South Africa)
DLIS	Department of Library and Information Studies (UB)
DOI	digital object identifier
DRPC	Departmental Research and Publications Committee (UB)
DVC	deputy vice chancellor
EASSy	Eastern Africa Submarine cable System
EC	European Commission
ERC	European Research Council
ETDs	electronic theses and dissertations
EU	European Union
FHSS	Faculty of Humanities and Social Sciences (UNAM)
FoH	Faculty of Humanities (UB)
FoS	Faculty of Science (UoM)
FTE	full-time equivalent
GDP	gross domestic product
GER	gross enrolment ratio
HEI	higher education institution
HERANA	Higher Education Research and Advocacy Network in Africa
HINARI	Health InterNetwork Access to Research Initiative
HoD	head of department
HOORC	Harry Oppenheimer Okavango Research Centre (UB)
HSRC	Human Sciences Research Council (South Africa)
HTML	hypertext mark-up language
IBSS	International Bibliography of the Social Sciences
ICT	information and communications technology
IDRC	International Development Research Centre (Canada)
ILRC	Information and Learning Resource Centre (UNAM)
IMF	International Monetary Fund

IP	intellectual property
IR	institutional repository
ISI	Institute for Scientific Information
IT	information technology
JISC	Joint Information Systems Committee
JPG	Joint Photographic Experts Group
JRF	junior research fellow
kbps	kilobytes per second
LION	Lower Indian Ocean Network
LMS	learning management system
LTS	Linux Terminal Server
MECHR	Ministry of Education, Culture and Human Resources (Mauritius)
MESR	Ministry of Education and Scientific Research (Mauritius)
MICT	Ministry of Information and Communication Technology (Mauritius)
MRC	Mauritius Research Council
MRC	Multi-disciplinary Research Council (UNAM)
MTESRT	Ministry of Tertiary Education, Science, Research and Technology (Mauritius)
MUR	Mauritian rupees (currency)
N$	Namibian dollar
NCRST	National Commission on Research, Science and Technology (Namibia)
NGO	non-governmental organisation
NHS	National Health Service (UK)
NIH	National Institutes of Health (USA)
NIHR	National Institute for Health Research (UK)
NRF	National Research Foundation (South Africa)
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OA	open access
OARE	Online Access to Research in the Environment
ODL	Open and Distance Learning
OER	open educational resource
OJS	Open Journal System
OpenDOAR	Open Directory of Open Access Repositories
ORD	Office of Research and Development (UB)
OSISA	Open Society Initiative of Southern Africa
P	Botswana pula (currency)
PALM	Publishing and Alternative Licensing Model
PAO	Profiling Academics Online
PDF	portable document format
PERii	Programme for the Enhancement of Research Information
PHP	Personal (Home Page) Hypertext Processor
PI	principal investigation
PLOS	Public Library of Science
PMS	performance management system (UB)
QA	quality assurance
R&D	research and development
RA	research assistant
RC	research coordinator

RCUK	Research Council United Kingdom
REF	Research Excellence Framework (UK)
RePEc	Research Papers in Economics
ROAR	Registry of Open Access Repositories
RSA	Republic of South Africa
RSS	really simple syndication
SADC	Southern African Development Community
SAFE	South Africa Far East (optical fiber submarine cable)
SALDRU	South African Labour and Development Research Unit (UCT)
SAPSE	South African Post Secondary Education
SARChI	South African Research Chairs initiative
SARUA	Southern African Regional Universities Association
SCAP	Scholarly Communication in Africa Programme
SDF	staff development fellowship (UB)
SRIF	Strategic Research and Innovation Framework (UoM)
SWORD	Simple Web service Offering Repository Deposit
TEC	Tertiary Education Council (Botswana)
TEC	Tertiary Education Commission (Mauritius)
TEI	tertiary education institution
THE	Times Higher Education
TIFF	tagged image file format
UB	University of Botswana
UBRISA	University of Botswana Research, Innovation and Scholarship Archive
UCCB	University Central Consultancy Bureau (UNAM)
UCT	University of Cape Town
UNAM	University of Namibia
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
URL	uniform resource locator
USAID	United States Agency for International Development
USD	United States dollar
VC	vice chancellor
VCILT	Virtual Centre for Innovative Learning Technologies (UoM)
VRE	virtual research environment
WoS	Web of Science
ZAR	South African rands (currency)

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Executive summary

The problem

African scholarly research is relatively invisible for three primary reasons:

1. While research production on the continent is growing in absolute terms, it is falling in comparative terms (especially as other Southern countries such as China ramp up research production), reducing its relative visibility.
2. Traditional metrics of visibility (especially the ISI/WoS Impact Factor) which measure only formal scholar-to-scholar outputs (journal articles and books) fail to make legible a vast amount of African scholarly production, thus underestimating the amount of research activity on the continent.
3. Many African universities do not take a strategic approach to scholarly communication, nor utilise appropriate information and communications technologies (ICTs) and Web 2.0 technologies to broaden the reach of their scholars' work or curate it for future generations, thus inadvertently minimising the impact and visibility of African research.

Visibility in this context amounts to more than just "accessibility" – it means *digital* accessibility. It means that a scholarly object is profiled in such a way that makes it easily findable by search engines or databases through a relevant search string. Thus, it requires a communications strategy, one of the ingredients missing in many African universities' and scholars' approach to research dissemination.

A key way to enhance Africa's research visibility, reach and effectiveness is by communicating it according to open access (OA) principles. Making all African research outputs clearly profiled, curated and made freely available to the public would give African research a higher likelihood of not only shaping academic discourse because it would be more visible to scholars, but of getting into the hands of government, industry and civil society personnel who can leverage it for development.

This approach is already taking root in the global North. In the past few years, major funding bodies in the EU, the UK and the USA have legislated open access mandates,

requiring that all research funded by them must be made open access. This will raise the visibility of those regions' research while (comparatively) lowering the visibility of Africa's research, which is not produced under a similar mandate.

However, most of the technologies required for engaging in open access communication are either already available at African institutions, freely available on the internet, or relatively inexpensive to purchase. Most also have access to the same free Web 2.0 technologies that allow individual scholars to enhance their scholarly profiles and collaborative opportunities. But these have not been incorporated into a strategic plan concerning scholarly communication, nor have enough African universities dealt with the skills and capacity challenges that new scholarly communication imperatives demand.

The research

The Scholarly Communication in Africa Programme (SCAP) was established to help raise the visibility of African scholarship by mapping current research and communication practices in four Southern African universities and recommending technical and administrative solutions based on experiences gained in implementation initiatives piloted at these universities. The universities that SCAP engaged were the:

- University of Botswana (UB)
- University of Cape Town (UCT)
- University of Mauritius (UoM)
- University of Namibia (UNAM)

Funded by the Canadian International Development Research Centre (IDRC), the three-year programme built on the findings of previous studies to address the particular challenges faced by African universities as they attempt to align their scholarly communication practices with rapidly evolving global standards in a manner that still reflects their core institutional values. The two questions driving SCAP's research were:

1. What is the current state of scholarly communication in (Southern) African universities?
2. How can the use of ICTs, technology platforms and open access publishing models contribute to the improvement of strategic scholarly communication, and what institutional structures are needed to support such an approach?

To answer these questions, SCAP conducted extensive research at these four partner institutions, working with the Department of Library and Information Studies (DLIS) at UB, the Southern African Labour and Development Research Unit (SALDRU) at UCT, the Faculty of Science (FoS) at UoM and the Faculty of Humanities and Social Sciences (FHSS) at UNAM. These entities served as our pilot sites. Over the course of four site visits, we obtained rich quantitative and qualitative data through "change laboratory" workshops (in which pilot site participants analysed their scholarly communication ecosystems), surveys, interviews, day-recall sessions, casual conversations and ethnographic observation.

This research was informed by Cultural Historical Activity Theory (CHAT), which allowed to us to approach these sites as historically dynamic and culturally complex systems, requiring us to understand them as comprehensively as possible before recommending interventions aimed at raising the visibility of their research outputs.

Research and communication practices

To understand the state of scholarly communication in Southern African universities, we explored scholars' values, research processes, scholarly outputs, communication practices, networks and collaboration preferences at our research sites. By comparing them, the diversity of the contexts and practices shaping scholarship in the region becomes clear.

Values

SCAP research found that, while all Southern African scholars are motivated by both extrinsic and intrinsic factors, the most powerful motivations (when aggregated and ranked) are: compliance with the institutional mandate to produce research (UB FoH), conformity to peer expectation to produce research (UCT Comm), congruence with personal desire (UoM FoS) and the desire to generate new knowledge and enhance teaching (UNAM FHSS).

These differing motivational factors make sense in their given contexts. UB scholars' high responsiveness to an institutional mandate is understood in a context where teaching has long defined scholars' identities and the administration's centralised managerial culture has guided academics' actions. The mandate has served as a crucial mechanism for encouraging scholars to incorporate research into their work. UCT scholars operate in a competitive, comparative and collegial context where there is a high peer expectation to produce research. It is the product of a strong research culture that has been developed over decades and supported by substantial resources. UoM scholars work under an administration that is highly centralised, but also quite weak; they are therefore free to choose how productive they want to be in terms of research. Their activity is shaped primarily by the personal desires that they feel. Meanwhile, UNAM scholars work in a developmental context which is both young and teaching-oriented; thus they are motivated to produce research so as to generate new knowledge and to enhance their teaching.

Research production

Most Southern African scholars say that they spend the majority of their time engaged in teaching-related activities (timetabling, prepping, lecturing, marking, advising, invigilating, etc.). They also say that they shoulder significant administrative duties. This was certainly the case at UB FoH, UoM FoS and UNAM FHSS, though most UCT Comm scholars were able to balance their research and teaching activities more equitably. Such heavy teaching and administrative requirements would be reasonable at institutions that see themselves as teaching-oriented universities, but for those that seek to become more research-oriented, the high teaching and administrative demands hinder Southern African universities from achieving the objectives of their new research-informed missions.

Outputs

Every university recognises research outputs differently, weighing each according to the values that it is trying to promote through scholarly performance assessment systems. At universities such as UCT, scholar-to-scholar outputs in high-prestige publication channels (WoS-rated journals, etc.) are prioritised far above outputs aimed at other audiences, while at more development-centred universities such as UB and UNAM, reward and incentive structures encourage scholars to produce a diversity of outputs aimed at local and international audiences, scholars and non-scholars.

Communication

While the Southern African scholars we engaged were quite interested in finding ways to increase their research productivity, they were far less responsive to the changing communication opportunities that new ICTs offer for disseminating their work. For the most part, they confined their communication activities to traditional modes. At UB, UoM and UNAM, that often meant reading their papers at regional or international conferences, sharing drafts with colleagues who request copies, incorporating insights from their research into classroom teaching or submitting their articles for publication in journals. At UCT (and to an extent at UoM), this meant producing scholar-to-scholar outputs to be published in high impact factor journals, books and conference proceedings. While the open access movement and availability of free online tools have expanded the opportunities for academics to profile their work on the internet and seek out collaborative partners, most Southern African scholars have yet to take advantage of them.

This means that many regional academics typically rely on face-to-face contact for disseminating their work (conferences), or they leave it to commercial publishing firms to handle (journals). They usually do not have a strategic dissemination plan that leverages the online platforms that would give greater visibility to their outputs. Nor are they encouraged to do so by their universities, as they receive no rewards or incentives for publishing in open access journals or profiling their work on institutional repositories. One of the consequences of this is that Southern African research often does not reach the audiences that could most benefit from it, such as government policymakers, development NGOs or community leaders.

Networks and collaboration

Southern African universities are characterised by highly variable levels of connectivity institutionally, nationally, regionally and internationally. Even though most universities desire to enhance their networks and number of collaborative engagements, each university's network profile is quite unique.

At UB FoH, scholars say that they do not communicate with each other much (due mainly to a lack of time and fora to do so), though they enjoy reasonable levels of connectivity with regional and international scholars (with whom they meet at conference events). UCT Comm scholars are highly networked within their faculty and internationally, but not so much with scholars outside their faculties in their own institution. They

also enjoy good connections with non-academics – such as civil society and industry personnel – as their work has applicability in a variety of contexts. UoM FoS scholars do not collaborate much with each other or others in the country, but enjoy extensive networks overseas (where most scholars who share their research specialisations are located). At UNAM FHSS, many scholars do not feel part of any type of research network yet, but those who do enjoy solid levels of connectivity within their faculty and internationally.

Despite these universities' drive to become more connected with other universities, many face significant financial and practical obstacles in pursuing research collaborations, especially with African partners who must deal with their own constraints. Thus, for a number of understandable reasons, they often end up collaborating with Northern-based research projects that require an "African partner".

Policy

Southern African universities enjoy varied levels of policy development, not only in terms of their research strategies (which are relatively well established) but also in terms of their communications strategies (which are largely undeveloped and only now receiving attention). How these policies are established and enforced, however, is often the result of the kinds of institutional cultures that define policy-related activities.

Open access

Southern African scholars have varying sentiments about open access (OA), but within our study, UoM FoS and UNAM FHSS scholars were the most positive while UB FoH and especially UCT Comm academics were cautious. The Mauritians' support was largely due to the fact that OA strategies resemble their normal scientific communication practices, thus they had a practical appreciation for it (as opposed to a moral one). Namibians were keen for OA not only for the benefit they could get from it as information-seeking scholars, but because they also saw how, if their outputs were made freely accessible, other Namibians would benefit from their research. However, despite these sentiments, neither of these faculties' members went out of their way to disseminate their work in an OA fashion because they did not receive any institutional recognition for doing so.

Institutional culture

The diverse histories, ages, demographics and purposes of Southern Africa's universities have given rise to a multiplicity of institutional types whose dominant characteristics help us to understand the implicit norms of their scholarly communication ecosystems and how managers and scholars operate within them.

UB's institutional culture is "managerial", in that it has a strong, centralised authority that wields power in a paternalistic, top-down fashion. This concentration of power has been useful in helping to speed up the process by which the entire institution falls in line with the new research mission and the OA ethic that the administration has (partially) embraced. But it has also bred resistance by faculty members who feel that their voices are not being heard by the administration.

UCT's institutional culture is "collegial" in that power emanates from the faculties, individual scholars enjoy great autonomy and intellectual freedom, and the central administration is highly responsive to its academic staff. This is useful in that most of the policies that are eventually adopted enjoy great legitimacy because they are the product of extensive consultation across the institution. But the downside is that, because scholars operate in "siloed" faculty structures, it can take a long time for otherwise good ideas (such as open access) to be adopted.

UoM's institutional culture is "bureaucratic" in that is characterised by a highly central-ised administrative structure that is nevertheless quite weak. Thus, on the one hand, the administration employs a variety of bureaucratic processes which ensure that even the smallest decisions made by academics refer back to it for official approval ("red tape"), thereby centralising authority within the institution. But on the other hand, it has largely vacated the strategic role that it should play in shaping the policies structuring research and dissemination activity, leaving scholars to decide on their own how much research they would like to conduct and how to communicate it.

UNAM's institutional culture is "developmental" in that leadership is not centralised (in a managerial fashion) nor decentralised (as in a pure collegial sense), but is distributed across faculties where senior scholars (or "elders") act as models who exemplify good research behaviour to others and, in turn, develop their capacity. Power in this system is not top-down (managerial) or side-to-side (collegial), but front-back (developmental).

Research culture

The research, communication and networking conditions in the region have developed what we can call "nascent" research cultures at most Southern African universities. Aside from UCT, which boasts a comparatively strong research culture, UB, UoM and UNAM are still in the process of building up their research cultures. While these universities are taking important strides in developing a more robust academic core based on new research missions, its completion will take time. This description is likely to change in the future as these universities continue to invest further resources into their research missions, and as the national governments build up research capacity through establishment of research foundations, councils and funds.

Infrastructure and capacity

These findings have stressed the importance of motivational systems and policies because, for the most part, the universities we dealt with already possessed the core technology components necessary to strategically address scholarly communication.

That said, the approach towards developing e-infrastructure for scholarly communication at institutional level was found to be largely haphazard, taking place in isolated pockets (often in a reactive sense); rather than being a considered, long-term exercise underpinned by proactive strategic engagement.

At a number of institutions, e-infrastructure for scholarly communication (such as repositories) had been developed as a result of externally funded programmes and implementation initiatives. While these supporting initiatives were deemed to be crucial for growing infrastructure and capacity in the region, the soft-funded nature of this development meant that the institution had not needed to commit to ownership and long-term maintenance of the infrastructure. It also meant that e-infrastructure had often been developed in a piecemeal, "cottage-industry" fashion without cognisance being given to interoperability and cohesive enterprise management of systems across the institution.

In order to fully institutionalise and harmonise infrastructure development and grow capacity, it was seen as crucial that institutions develop a supporting policy framework; a component of which would constitute transformation of existing reward and incentive structures to scale and support new areas of scholarly communication activity.

Implementation initiative

These implementation initiatives that we carried out at each pilot site give an indication of not only the diversity of scholarly communication ecosystems at Southern African universities, but how they are shaped by history, culture, traditions, capacity, disciplinary norms and visions for the future. Rather than being assumed to share a general set of challenges to be addressed with a single technology or policy solution, each ecosystem had to be researched and understood before an implementation initiative could seek to improve scholarly communication in those contexts. To increase the likelihood of success in each case, we not only carried out extensive research with pilot site participants and university managers and librarians, but we elicited participants' desires regarding how they wanted their activity systems to change and tried to implement pilots that spoke to their desires. This was not always easy – especially since many scholars were not aware of the various tools, technologies and strategies available to enhance their scholarly com-munication and visibility – thus we tried to improve their own analyses and insights by sharing with them trends and developments from around the world in this regard. Our relationship was thus a partnership in which we collaborated to improve their scholarly communication ecosystem, with feedback from inside and outside these systems.

Recommendations

Based on the insights yielded from our research and implementation activities, SCAP believes that four stakeholders can play a key role in improving Southern African universities' dissemination activity, to whom our recommendations include the following:

To national governments

- *Establish national research foundations* so that scholars can seek local funding from more sources than just the university research budget.

- *Design a virtuous research funding cycle* in which, for each recognised output produced by a scholar and disseminated in an open access fashion, funds are directed into that scholar's faculty research budget so as to spur further research activities.

To university administrations

- *Offer a reduction in teaching time to scholars* who demonstrate ambitious research activity.
- *Establish digital platforms for sharing publication success* by university scholars.
- *Develop policies mandating that all publicly funded research be made open access.*
- *Put all university-affiliated journals online and make them open access.*
- *Induce academic staff to create personal profiles on their departmental web pages.*
- *Establish or identify support service providers who can translate scholars' research* for government- and community-based audiences.
- *Develop a network of communication officers/content managers* so that disparate dissemination activity can be pursued in a more cohesive and strategic manner.
- *Encourage scholars to share their research insights on Wikipedia.*
- *Invest in training for library staff* so that they can operate effectively in the new scholarly communication landscape.
- *Train and incentivise scholars to use Web 2.0 platforms.*

To university scholars

- *Share responsibility with the administration for research visibility.* Communicate research findings to the audiences that could best leverage them for developmental purposes.

To research funding agencies

- *Determine the feasibility of developing a regional megajournal.*

Chapter 1
Programme overview

The Scholarly Communication in Africa Programme (SCAP) was established to help raise the visibility of African scholarship by mapping current research and communication practices in four Southern African universities and by recommending and piloting technical and administrative innovations at these sites based on open access dissemination principles.

SCAP was founded with the understanding that African scholarly research is relatively invisible for three primary reasons:

1. While research production on the continent is growing in absolute terms (Metcalfe, Esseh & Willinsky 2009; Mouton 2010; Tijssen 2007), it is falling in comparative terms (especially as other Southern countries, such as China,[1] ramp up research production), reducing its relative visibility.
2. Traditional metrics of visibility (especially the ISI/WoS Impact Factor),[2] which measure only formal scholar-to-scholar outputs (i.e. journal articles and books), fail to make legible a significant amount of African scholarly production, thus underestimating the amount of research activity on the continent.
3. Many African universities do not take a strategic approach to scholarly communication, nor utilise appropriate ICTs and Web 2.0 technologies to broaden the reach of their scholars' work or curate it for future generations, thus inadvertently minimising the impact and visibility of African research.

The first challenge listed here speaks to a global phenomenon that is defined by macro-level disparities in resources, infrastructure, capacities and population sizes. These

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1   Julia Chan (2011) Asia: the growing hub of scientific research, *The Asian Scientist*. Available at: www.asianscientist.com/features/asia-future-hub-scientific-research/
2   The Impact Factor – a metric devised by the Institute for Scientific Information (ISI) in the 1960s and now maintained by the Thomson Reuters Web of Science (WoS) – purports to measure the "impact" of a journal within a given academic field and, by proxy, suggest an evaluation of the relative impact of the articles published within it. The Impact Factor is a number representing the average number of citations that a journal's articles collectively receive during a two-year period. Thus if the Impact Factor for a journal in 2011 is 4, then the articles published in that journal in 2009 and 2010 collectively averaged four citations each in 2011.

disparities help make sense of Africa's various higher education predicaments, but they cannot be changed by a research project such as SCAP. Thus, while the SCAP team was always cognizant of this overriding context that structured the scholarly communication possibilities in Africa, we did not focus on tackling them, but rather on the latter two challenges, which were located in our sphere of influence.

The second challenge – concerning scholarly visibility metrics – is also a global phenomenon, but largely confined to the academic community and a matter of intense debate. Traditional scholarly metrics are under threat by funders, research assessment officers, open access publishers and alternative metrics advocates who seek to utilise the capacity of Web 2.0 platforms to gain a more accurate and comprehensive sense of the impact that a scholarly output has (beyond the blunt journal citation aggregations that WoS provides). Because many scholarly outputs from Africa are not published in WoS-listed journals – but rather in a plethora of other outlets – they do not get measured in the prestige-based indices that render so much of African research (including reports, briefs, conference papers, seminar presentations, consultancy work, etc.) invisible.[3] The conclusion that many analysts draw from this is that no research of value is taking place on the continent – an inappropriate conclusion given the limited perspective it provides of African research production. Therefore, in our effort to raise the visibility of African research, we advocated for scholars worldwide to use a more comprehensive, precise and "complementary" set of metrics than those currently used to assess scholarly visibility.

The third challenge – concerning the lack of strategic engagement with scholarly communication by African universities – was the main issue that SCAP hoped to change. This is a challenge located largely within the boundaries of the continent, the product of choices and priorities by African governmental ministers, university managers and academics. As a research and implementation initiative located in Africa, committed to locally appropriate solutions, SCAP decided to intervene at this level where we could have the greatest effect. It was our belief that if we could research and advocate a more strategic approach to scholarly communication, we could not only raise the visibility of Southern African research, but also offer a model to other African universities seeking to do the same. This would be based on strategic policy innovations, open access principles and Web 2.0 ICT platforms.

The universities that SCAP engaged were the:

- University of Botswana (UB)
- University of Cape Town (UCT)
- University of Mauritius (UoM)
- University of Namibia (UNAM)

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3   Mouton (2010: 8) states that "international publication in the ISI-journals (19,154 articles for the total period 1990–2007) only constitutes about one-third of total social sciences scholarship in the [Southern African] region." This corresponds with the ratios given by the University of Namibia in a recent research report that says "the year under review has seen a total output of 394 publications from the University, 23% of which are peer-reviewed journal articles and 11% are books and book chapters (UNAM 2009: 6), meaning that 66% of outputs were "other" types (2009: 9), guaranteed to be invisible according to the ISI/WoS index. This high production ratio of non-indexed materials in the region is discussed in more detail in Chapter 5.

Scholarly in/visibility

Scholarly communication comprises a broad range of activities "including the discovery, collection, organisation, evaluation, interpretation, and preservation of primary and other sources of information, and the publication and dissemination of scholarly research" (Cullyer & Walters 2008: 1). In this report, it will largely focus on the communication activities necessary for research collaboration and output dissemination. However, the effectiveness of this communication – especially output dissemination – is shaped by the fact that audience attention is a scarce resource. There are more scholarly outputs produced than can be equally engaged by the academic community, meaning that scholarly outputs are in a state of competition with each other, with some achieving greater "visibility" than others.

According to Abrahams, Burke and Mouton (2010: 22), "visibility is comprised of a number of features including visibility of authors and content through abstracting and indexing databases, through availability in library collections, through web-based publishing, and visibility of research performance as measured through various bibliometric measures such as citation counts and impact factors." It is not simply publication in a journal listed by the Thomson Reuters WoS, which has for a long time been the standard by which visibility is assessed. Rather:

> *Visibility of scholarly communication means that specific knowledge and authored works can be discovered because they are traceable. More importantly, in this regional context, visibility means that research on subjects and themes of local interest should be made public in ways that will enable the relevant actors (researchers, students and development practitioners) to easily identify local research that can be a valuable contribution to society, whether for future knowledge production or for development practice.* (Abrahams, Burke & Mouton 2010: 22–23)

This means that visibility amounts to more than just "accessibility" (such as when an object is available in hard copy at a university library). It means digital accessibility. Moreover, it means that a scholarly object is profiled (usually through metadata) in such a way that makes it easily findable by search engines or databases through a relevant search string. Without such metadata, or without the object shared in a format that allows crawlers to search its text (such as PDFs and HTML pages rather than TIFFs and JPGs), then the digital object remains virtually invisible. In those cases, it is technically accessible, but essentially invisible because it is not locatable using standard searching procedures. Thus, visibility requires a communications strategy, one of the ingredients missing in many African universities' and scholars' approach to research dissemination.

This lack of strategy is partially responsible for the disorienting image in Figure 1.1 which visually represents the relative contributions made by each country to global scientific research output as published in ISI-listed journals (in 2001). The fish-eye effect of this perspective squeezes the massive African continent down to the size of a narrow peninsula, thus begging explanation. However, this startling representation is indicative not of the absence of research activity per se, but of the continent's lack of representation in

"international" journals and its inefficiency at disseminating research findings in a more strategic, representational manner. As Tijssen (2007: 307) points out:

> *It is important to keep in mind that these diminishing shares of African science do not reflect a decrease in an absolute sense, but rather an increase less than the worldwide growth rate. During the last 15 years, African output has in fact risen by 38%, up to some 46,000 articles in 2001–2004.*
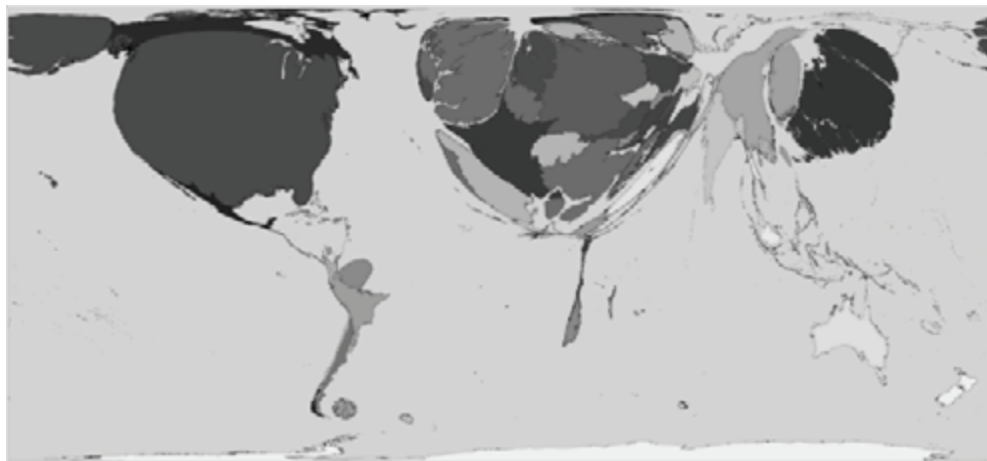
Figure 1.1 Representation of global scientific output, by proportion of ISI article production[4]

Chan, Kirsop and Arunachalam (2011: 1) further caution against an over-simplified reading of this cartographic representation, in that "this inequity has led to the misguided notion that little, if any, research of substance is generated in the global South, and that the needs of researchers in poor countries are therefore met solely by information donation from the North." However, given that this map is based on data from 2001, it likely shows Africa in a "thicker" visual profile than if the numbers were current. It does not account for the explosion of research production from places like China, which would render Africa's profile even "skinnier", despite the continent's absolute increase in highly rated scientific publications.[5] Thus the challenges regarding Africa's visibility remain a persistent concern even as scholarly communication trends evolve.

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4   The map illustrates the relative proportions of ISI-rated scientific papers published per million people in 2001. This covers articles in physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering, technology, and earth and space sciences. The number of scientific papers published by researchers in the USA was more than three times that published by the second-most-publishing nation, Japan. Source: www.worldmapper.org/display.php?selected=205 [accessed 2 September 2010]. Image copyright SASI Group (University of Sheffield) and Mark Newman (University of Michigan). Permission has been granted to reproduce this figure under the terms of the Creative Commons Attribution License.

5   This particular Worldmapper image has not been updated since 2001 according to Professor Mark Newman (private communication), one of the creators of the map. Other evidence that we have drawn from Tijssen (2007) and Mouton (2010) suggests that an updated map would actually make Africa appear even less visible. Indeed, due to its comparatively low level of outputs in ISI-rated journals, Africa is often lumped into a "rest of the world" category in various research impact reports. (See for instance the National Science Foundation's *Science and Engineering Indicators 2012 Digest* section on "Research Outputs: Publications and Patents" at: www.nsf.gov/statistics/digest12/outputs.cfm#1)

Furthermore, as Mouton (2010: 6–7) explains:

> *The ISI-journals have a distinct Anglophone bias which leads to poor coverage of Francophone and (to a lesser extent) Lusophone countries in SSA [sub-Saharan Africa]. In addition the ISI's coverage of small journals in developing countries is not good. The latter is a result of the policy of the ISI to include only the highest impact journals in the world which means that many journals in the developing countries (which have small circulation lists and hence restricted readerships) are thereby automatically excluded. All of this means that a significant proportion of African social science is simply not visible in international indexes.*

Hence, because so much African scholarship remains outside of the ISI/WoS index, and because continental institutions and scholars have not applied a cohesive or strategic approach to disseminating outputs, "there is a preponderance of unpublished research, including conference and advocacy papers, technical and consultancy reports, theses and dissertations ('grey' literature) which is not easily accessible because it is generally not held in university libraries or available online" (Abrahams, Burke & Mouton 2010: 29).

Of course, institutions around the world face new imperatives to increase investment in research production and knowledge management. For research institutions, this means adopting a strategic focus on content curation and profiling so as to boost institutional reputation, remain competitive in global institutional rankings, provide support services that academics rely on to conduct research and collaborate internationally, and maintain compliance with grant funder mandates.

For African higher education institutions (HEIs) there are additional pressures for developing scholarly communication practice and ramping up the institutional content curation effort. For instance, faced with limited research grant funding and constrained by international publishing opportunities, African HEIs must choose whether they want to support local (particularly niche) research by making outputs from that effort freely and openly available. Doing so would encourage the production of local scholarship and ensure that African scholars have access to locally relevant content by authors embedded in the context. But failing to do so would wither nascent research buds on the continent, forcing greater reliance on externally produced research. As Abrahams, Burke and Mouton (2010: 24) point out:

> *Students, researchers and practitioners are likely to cite and utilise authored works from abroad over work from the region because of high versus low visibility in particular areas of study, such as in genetics, education and environmental engineering, where research output is particularly low. Thus, low visibility and low accessibility are major factors in slowing down research production on the sub-continent, thus limiting the application of knowledge for development purposes.*

The need for research to address development is not unique to the African context, but the links between dissemination, innovation and development increase the imperative

(and prospective return) for African universities to profile and curate their own research. In line with this approach, the knowledge production enterprise funded by taxpayers needs to move beyond a "closed" academic enterprise (in which knowledge exchange typically happens on a scholar-to-scholar basis by means of the traditional journal article or book chapter) to an "open" exchange process that includes scholar-to-community and scholar-to-government activities (utilising a broad range of content formats and genres).

Open access for development

A key way to enhance the visibility, reach and effectiveness of African research is by communicating it according to open access (OA) principles. By "open access", we mean that scholarly research outputs are made freely available:

> *on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles [and other output types], crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.* (BOAI 2002)[6]

Making all African research outputs clearly profiled (through metadata), curated (on stable digital platforms) and freely available to the public (at no cost to the user) would give African research a higher likelihood of not only shaping academic discourse because it would be more visible to scholars, but of getting into the hands of government, NGO, industry and civil society personnel who can leverage that research for economic growth and development.[7]

According to Chan, Kirsop and Arunachalam (2011: 1), the growing volume of OA resources "provides a far greater degree of freedom for researchers to exchange and collaborate, for knowledge to be translated into useable forms by frontline health workers, and for emerging technologies such as text mining and semantic tagging for faster knowledge discovery to be used." Moreover, research shows that OA publication increases the likelihood that a scholarly output is both read and downloaded at a higher rate than non-open access publications (Gargouri *et al.* 2010).

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6   A number of groups and organisations – in Budapest (2002), Bethesda (2003) and Berlin (2003) – have defined open access from slightly different perspectives. For a useful discussion of open access, see: Suber 2012; Peter Suber's "Open Access Overview" available at: http://legacy.earlham.edu/~peters/fos/overview.htm; and the OASIS (Open Access Scholarly Information Sourcebook) article, "Open Access: What is it and why should we have it?" available at: www.openoasis.org/index.php?option=com_content&view=article&id=130&Itemid=390

7   For example, "the publicly funded Human Genome Project and its freely reusable data generated a massive 141-fold return on investment in economic returns alone … [and] 30% more new clinical products than the privately funded, closed genome-sequencing project of the US biotech firm Celera Genomics" (Neylon 2012).

However, at the moment, "many research publications by African researchers, especially those focused on domestic or regional African issues and problems, are not accessible through the modern ICT facilities" (Tijssen 2007: 324). Furthermore, "multiple stakeholders including university presses, libraries, and central IT departments are challenged by the increasing volume and the rapidity of production of these new forms of publication in an environment of economic uncertainties" (Harley 2008: 2).

This means that African universities – many of which are only now beginning to develop research agendas of their own – must also establish new capacity, processes, governance structures, business models and policy frameworks for open access communication. This is not a trivial matter, nor is it easily achieved. Yet despite the burden that a move to a strategic engagement with OA would mean for most African universities, SCAP remains convinced that it must proceed.

Consider the broader open access context in which African scholars must chart their path: in the past few years, major funding bodies in the EU, the UK and the USA have legislated open access mandates, requiring that all research funded by them must be made OA (see Chapter 4 for more details on funder mandates). This will raise the visibility of the North's own research outcomes while (comparatively) lowering the visibility of Africa's research, which is not produced under a similar mandate. The flood of research that will emerge from the North will further marginalise the relatively small volume of outputs coming from Africa. This research will not only be openly shared, but will be curated and described with metadata, making content interoperable, searchable and indexable at unprecedented levels.

These developments – which will likely be matched in other parts of the world soon – require urgent action from African institutions. SCAP believes that this marks an opportunity for African universities to move beyond playing "catch-up" with the North to leveraging new technologies and approaches to address local ambitions while participating in the international scholarly landscape.

Technology and capacity

Africa's response to this changing communications environment will require not only strategic dissemination policies and OA publishing practices, but appropriate use of new technologies that are reshaping the scholarly communication environment. The advances in ICTs over the past years – such as broadband internet, Web 2.0 platforms and inexpensive digital storage devices – have transformed scholarly communication. Yet, to date, many ICT innovations have failed to act as an equalising force in academic collaboration and contribution on the continent. In some ways, they have reinforced familiar global inequalities that resemble a "digital divide" (Fuchs & Horak 2008) between the visible and the invisible.

However, this need not be the case in the future. Most of the technologies required for engaging in OA communication and visibility-raising dissemination are either already available at African institutions, freely available on the internet or relatively inexpensive

to purchase. For instance, many African universities possess high-resolution scanners, institutional repositories, websites, computers, servers and access to the internet.

They also have access to the same free Web 2.0 technologies[8] – such as Academia.edu, ResearchGate, Mendeley and FigShare – that have allowed individual scholars elsewhere to enhance their scholarly profiles and collaborative opportunities. The problem is that these have not been incorporated into a strategic plan concerning scholarly communication. They have been utilised in an ad hoc fashion, often the pet project of a lone innovator, but not part of a systematic approach to an institutional issue. Thus the solution is not simply to have "access" to current technologies, but to have a plan for how to use them.

Moreover, the incorporation of new ICTs into an existing scholarly ecosystem requires the skills and capacity to support and maintain them. This is often lacking at African universities where training efforts focus on other aspects of a job (such as book cataloguing for librarians rather than DSpace metadata capturing of alternative outputs). It is also due to a lack of funding to hire and train new people.

Thus, each of these elements is important for raising the visibility of African scholarship: an open access dissemination strategy, access to and use of Web 2.0 technologies and the human capacity and skills to use them. Each of these exists within reach of most African universities, but only if they are made a priority. The SCAP project was initiated to help achieve that.

Project description

Funded by the Canadian International Development Research Centre (IDRC), the three-year SCAP programme, which commenced in 2010, built on the findings of a number of previous studies and interventions[9] to address the particular challenges faced by African universities as they attempt to align their scholarly communication practices with rapidly evolving global standards in a manner that reflects their core institutional values.

SCAP was a research and implementation initiative that sought to demonstrate, through the use of case studies and the development of a research evidence base, the financial, institutional and technical feasibility of universities in Southern Africa assuming greater responsibility for publishing their research in an open manner. Its central aim was to increase the visibility of African research and scholarly communication.

The primary question driving SCAP's research was:

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8   In the context of this project, Web 2.0 (or Web 2) refers to advanced internet technology and applications such as blogs, wikis, social networking sites, bookmarking services and really simple syndication (RSS) feeds. These technologies are commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centred design and collaboration.

9   At the local level, these included UCT Centre for Educational Technology projects funded by the Shuttleworth Foundation in the period 2006 to 2009, namely the OpeningScholarship project and the UCT Open Educational Resources initiative, as well as other IDRC-funded initiatives such as the PALM project. At the regional level, the programme was strongly informed by prior research and networking activity of the Southern African Regional Universities Association (SARUA) and the activities of the IDRC Open African Innovation Research and Training (OpenAIR) intellectual property research programme.

> *What is the current state of scholarly communication in (Southern) African universities?*

To answer this, SCAP visited each partner university four times over the course of two years in order to conduct interviews with scholars, librarians and managers, and to gather data through seminars, "change laboratory" workshops and surveys (a process discussed in detail in Chapter 2).

A secondary question driving our research was:

> *How can the use of information and communications technologies (ICTs), technology platforms and open access publishing models contribute to the improvement of strategic scholarly communication, and what institutional structures are needed to support such an approach?*

To answer this, SCAP engaged in a series of institution-based implementation initiatives at each pilot site, stimulating the research environment and observing the results (discussed in detail in Chapter 6).

The specific objectives of the project were seven-fold:

1. Map the current status of research dissemination in four selected universities from four Southern African countries.
2. Understand the policy, ICT infrastructure and administrative support systems needed to integrate scholarly publishing and dissemination at these universities.
3. Work with partners from selected universities to support the use of open-source platforms that could interface with outputs such as journals, books and conference proceedings.
4. Build capacity in managing and sustaining an integrated scholarly communication system.
5. Explore the costs and benefits resulting from open access communication.
6. Develop complementary metrics that could align quality concerns, recruitment, recognition and rewards systems in order to promote greater access to knowledge.
7. Engage with institutional and governmental policymakers to raise the visibility of African research.

SCAP was originated in response to the need to grow the profile and global competitiveness of African research output. The project's primary concern was with dissemination out of universities rather than issues around building research capacity. That said, it acknowledged the intrinsic link between research processes and communication, and the importance of examining current scholarly communication policy, practice and infrastructure against the institutions' wider cultural historical contexts.
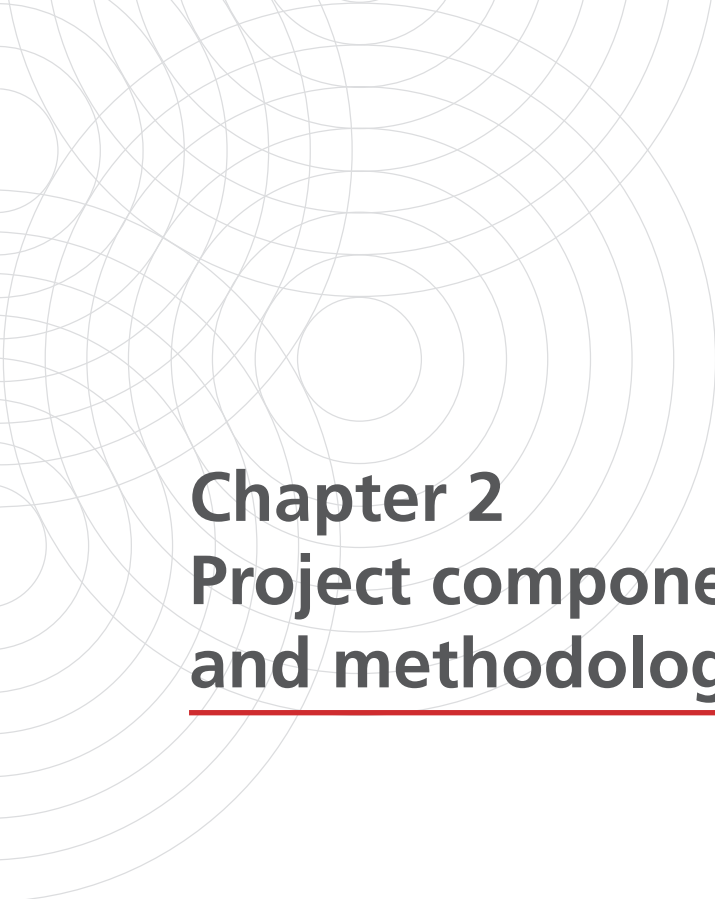
The complex nexus of issues and the interrelationships between low research productivity, declining annual national expenditure on research and development, and other national and regional factors affecting scholarly productivity has been documented in other

studies, such as those by Abrahams *et al.* (2008), ASSAF (2006), Cloete, Bailey and Maassen (2011), Habib and Morrow (2007), Harle (2010), Kotecha, Walwyn and Pinto (2011), Kotecha, Wilson-Strydom and Fongwa (2012), Mouton (2010) and Mouton *et al.* (2008). The SCAP research and implementation process built on this complex-systems approach seeking not only to understand institutional scholarly communication activity systems across micro (department/faculty/unit), meso (institutional) and macro (national/regional) levels, but also to grasp how these systems have been shaped by historical factors over time.

SCAP operated on the assumption that although African higher education environments faced a myriad of challenges, there was an opportunity to increase the production and visibility of scholarly outputs in Africa through the use of Web 2.0 technologies, digital publishing and curation platforms, and confederated computing and content hosting structures.

But before these opportunities could be harnessed, each institution's scholarly communication ecosystem had to be described, analysed and understood – a process necessitating significant research (the results of which are discussed in Chapter 5). It also required an ambitious advocacy component that required us to engage with university scholars, librarians and managers, as well as other higher education stakeholders in government and civil society.

This study shares the results of SCAP's research and advocacy efforts, describing not only the scholarly communication ecosystems that currently exists at these partner institutions, but the opportunities available for raising the visibility of their scholarship. It concludes with a discussion of our research findings and a series of recommendations – aimed at the national governments, university managers, university academics and research funding agencies – that we believe would enhance the communicative and developmental potential of these universities' research and offer a model for other continental and regional universities.

Chapter 2
Project components and methodology

The SCAP programme arose from an 18-month scoping process that took place in 2008/2009 under the direction of Eve Gray, an African scholarly communications and open access expert (Gray 2006, 2010; Gray & Kahn 2010; Gray, Trotter & Willmers 2012). Hosted jointly by the Centre for Educational Technology and the Research Office at the University of Cape Town, SCAP was launched in March 2010.

Selection of pilot sites

One of SCAP's first tasks was to identify the three other universities – along with UCT, SCAP's host institution – to participate as partner sites. Though SCAP hoped that our work would be able to impact the discourse on scholarly communication throughout Africa, for practical (financial, logistical and linguistic) reasons, we decided to focus our research on universities in the Southern African Development Community (SADC) region. Through a collaborative process with the Southern African Regional Universities Association (SARUA),[10] SCAP assessed potential university partners against a series of criteria such as level of research engagement, history of dissemination activity, as well as other characteristics such as size and language.

The four institutions in the SCAP sample happened to be in the most research-productive countries in the region according to the Thomson Reuters ISI index. As Mouton *et al.* (2008) show in Table 2.1, South Africa is the most productive country in the region, producing an average of 80% of all output in SADC for the period 1990–2007 (119 papers per million of population compared to the regional average of 29 papers per million). Botswana was the second most productive country with 96 papers per million, while Mauritius and Namibia were the only other two countries with productivity levels above the regional average.

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10   SARUA is a regional higher education and vice chancellors' forum operating in SADC with a strong open access strategic focus. See: www.sarua.org/

Table 2.1 Ranking of SADC countries in terms of ISI papers per million of the population (2007)

Country	Total population millions (2007 est.)	ISI papers (2007)	Papers/million of population
South Africa	47.0	5.505	119.3
Botswana	1.8	172	95.5
Mauritius	1.2	47	39.1
Namibia	2.0	70	35.0
Zimbabwe	12.3	251	20.4
Swaziland	1.1	18	16.4
Malawi	13.6	209	15.4
Zambia	11.5	155	13.5
Tanzania	39.3	492	12.5
Madagascar	19.4	150	7.7
Lesotho	2.1	13	6.2

(Source: Mouton *et al.* 2008)

Despite concerns about the value of the ISI system (which we detail in Chapter 3), these indicators were useful in terms of categorising the study sites in relation to other SADC higher education institutions (HEI) and their apparent research productivity. The fact that SCAP was working with universities from the four most research-productive countries in the region meant that we could explore correlations between size, output productivity and capacity in determining how feasible it was for regional institutions to profile the knowledge they produce. Though many differences exist between SADC institutions, if the most productive of these faced visibility challenges, then it stood to reason that the others would face similar problems, perhaps even more acutely.

Once the universities of Botswana, Mauritius and Namibia were nominated, SCAP reached out to their vice chancellors to propose partnerships. We sought to obtain senior managements' mandates to engage with their institutions' academic communities and to create the necessary buy-in for us to research these communities' scholarly activities. Institutions were invited to designate research coordinators (RCs) – senior academics with an interest in open access practices – who would facilitate identification of pilot sites within the institution and to appoint research assistants to assist with data collection and other project work.

We believed that it was not feasible, given time frame and resource constraints, to research the scholarly communication practices of academics throughout the entire university; therefore we focused on pilot sites that we hoped would act as microcosms of the institution, allowing us to extrapolate lessons learned and recommendations for sharing with the rest of the institution – and to other African institutions.

We realised that scholarly communication in these contexts would be impacted by varying institutional, disciplinary and cultural norms; we therefore always tried to remain clear as to which structural forces were doing the most to shape a particular activity. While this minimised our capacity to generalise across all four sites in certain respects, it

also allowed us to understand the diversity of these contexts and gain a nuanced sensibility about their challenges and opportunities. With this point in mind, the following served as our pilot sites:

- UB: Department of Library and Information Studies (DLIS) in the Faculty of Humanities (FoH) – 18 members
- UCT: Southern African Labour and Development Research Unit (SALDRU) – an independent research unit in the Faculty of Commerce (Comm) – 32 members
- UoM: Faculty of Science (FoS) – 55 members
- UNAM: Faculty of Humanities and Social Sciences (FHSS) – 77 members

SCAP approached each of the study sites as unique contexts with independent historical legacies and research communication cultures. Therefore efforts were made to ensure parity in project activity across the sites. However, the principal investigation (PI) team acknowledged that the approach to UCT would be slightly different because we were already "embedded" in the institution, a fact that both limited and expanded the kinds of insights we could gain about it.

Moreover, we understood that UCT was atypical in both Africa and Southern Africa. As the highest-ranked university on the continent[11] with a history stretching back to the 1820s,[12] UCT enjoyed significant financial, infrastructural and human capacity advantages over the other three universities. It also boasted a significantly larger academic staff: according to the most recent public figures, UCT[13] had 2,200 academic staff, UB[14] had 877, UNAM[15] had 340 and UoM[16] had 293. Nevertheless, these differences did not invalidate a comparison across institutions, but simply begged for continued recognition of the structural and historical differences that defined them.

The principal investigation (PI) team

SCAP research was led by a PI team based in UCT's Centre for Educational Technology (CET), a department in the Centre for Higher Education Development (CHED). This team comprised a research lead, a research officer, a research assistant, the programme manager and the programme director. All research work was undertaken in consultation with RCs at participating sites, but the ability of RCs to formulate and conduct independent research was constrained by the fact that they held academic posts with concomitant teaching and administrative loads. In addition, the RCs had been placed in the role because of their interest in the area, not necessarily their expertise. There was therefore significant capacity development entailed in the exchange between the PI team and institutional research teams.

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11 This is according to the 2012–2013 Times Higher Education World University Rankings, available at: www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking/region/africa

12 Ages of participating institutions – University of Botswana: 30 (founded 1982), University of Cape Town: 183 (founded 1829), University of Mauritius: 47 (founded 1965), University of Namibia: 20 (founded 1992).

13 See UCT 2012.

14 UB Facts and Figures (2013), available at: www.ub.bw/content/id/1989/Facts-and-Figures/

15 SARUA profile of UNAM, available at: www.sarua.org/?q=uni_University%20of%20Namibia

16 UoM: History (2011), available at: http://sites.uom.ac.mu/induction/index.php?option=com_content&view=article&id=46&Itemid=1

The SCAP programme was designed around four rounds of institutional site visits to each of the participating sites. These visits allowed the PI team to build institutional relationships, collect research data and formulate a framework for implementation activity. The PI team also gave presentations, ran workshops, conducted interviews and engaged in individual conversations with a wide range of stakeholders on each visit in order to stimulate discussion around scholarly communication.

The site visits also gave the PI team a more nuanced, ethnographic understanding of the lived reality of the pilot academics. Team members were able to see (and sometimes experience) first-hand the administrative, technological and social qualities defining scholarly communication activity at our partner sites. (For instance, by using the internet at some universities, we could see what scholars meant when they complained of low bandwidth; or by trying to source official information from certain universities, we could identify with scholars' "red tape" woes.)

Methodology

SCAP's overall research design was based on the case study approach. We adopted this so that we could conduct in-depth research at four universities in four countries across different faculties and disciplines and so that we could experiment with a diverse set of intervention strategies. The case study approach allowed us to probe deeply into the different field sites (Flyvbjerg 2011; Mitchell 1984) while at the same time ensuring that some of our data would be comparable across them.

SCAP's methodological approach could be categorised as "developmental intervention-based research", as it went beyond a concern for only data collection to that of research as praxis, aiming to enable participants to understand and change their realities. To help develop capacity and stimulate our pilot environments, the programme incorporated implementation processes for experimenting with new approaches to open scholarly communication that ran alongside our research process.

Cultural Historical Activity Theory

SCAP used Cultural Historical Activity Theory (CHAT) to inform our research approach. We chose CHAT because it is useful for identifying obstacles in complex activity systems, especially those that are structured by deep, complicated and sensitive cultural and historical elements.

With its origins in Soviet social psychology in the earlier part of the 20th century – in particular the work of Vygotsky and Leont'ev (Chaiklin & Lave 1993; Daniels 2008) – the key tenets of early Activity Theory is that activity is mediated action and that the social and the technical are mutually constituting. These tenets were then developed by Engeström (1987, 2000; Cole & Engeström 1993) into the CHAT approach that we utilised, which locates the activity systems concept at its centre.

An activity system is a collective formation in which a subject (here referring to a group, not an individual) acts purposefully towards the fulfilment of an object and a set of

outcomes. Figure 2.1 shows a representation of an activity system with its constituent nodes placed at distinct points on the triangle.
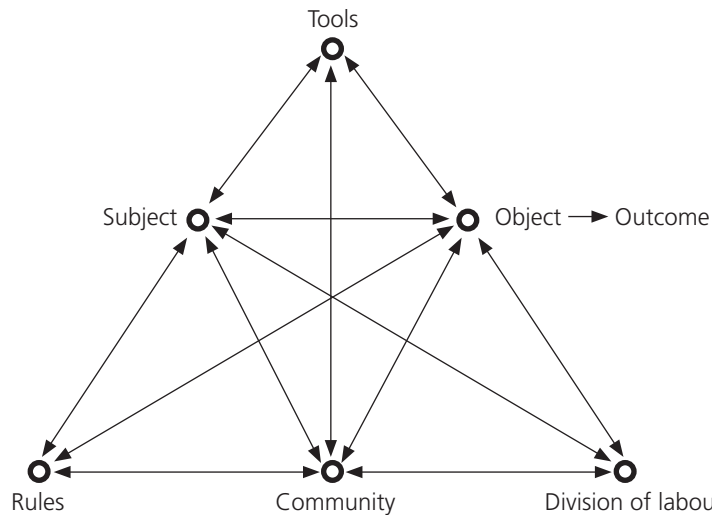
Figure 2.1 Representation of an activity system in the CHAT tradition

The diagram above represents the different nodes that constitute an activity system. Starting with the top horizontal line, a subject seeks to achieve a purpose (the object) which will result in an outcome. In our research, the subjects were academics seeking to produce and disseminate research (the object) so that they could contribute to national development, secure promotion, comply with an institutional mandate, etc. (outcomes).

During this process, subjects utilise tools (the top node) such as computers, books, personal credentials and other artefacts to achieve their purpose. This means that all action is "mediated" by the use of such tools.

Along the bottom horizontal line are three further nodes that also serve to mediate action: rules, community and division of labour. According to Engeström (1996: 67), the rules refer to the explicit and implicit regulations, norms and conventions that enable and constrain action within a system. In our context, these rules were often disciplinary norms (informal) and institutional policies (formal).

The community comprises the people and groups sharing the same general object as the subject. In our context, these were typically funders, colleagues, librarians, managers and students.

Lastly, the division of labour refers to the horizontal division of tasks between members of the community and the vertical division of power and status. In the case of academics, the horizontal division involves relationships with peers (inside and outside the university) in the production and communication of research, while the vertical division involves relationships with research and university managers, as well as national research structures. The various non-academics listed in this node also have their own

activity systems that are devoted to different objects. These other activity systems exist in fluctuating states of tension and alignment with this focal activity system, depending on how they are structured and engaged.

A key virtue of this design is that it presents activity systems as "ecosystems", in which stimulation or change in one node leads to transformations throughout the entire system. For instance, the introduction of new tools (repositories, etc.) or the alteration of rules (policies, etc.) would impact the entire system. Thus, we thought of these activity systems as ecosystems that were unique, dynamic and sensitive to change.

CHAT principles

In CHAT theory, activity systems are defined by five key principles:

1. *Collective activity*: "A collective, artifact-mediated and object-oriented activity system is taken as the prime unit of analysis. Activity systems realise and reproduce themselves by generating actions and operations" (Engeström 2001: 136).
2. *Multi-voicedness*: "An activity system is always a community of multiple points of view, traditions and interests. The division of labour in an activity creates different positions for the participants [and] the participants carry their own diverse histories" (Engeström 2001: 136).
3. *Historicity*: "Activity systems take shape and get transformed over lengthy periods of time. Their problems and potentials can only be understood against their own history" (Engeström 2001: 136).
4. *Contradictions*: Instability (internal tension) and contradictions are the "motive force of change and development" (Engeström 1999: 381). "Contradictions are not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems" (Engeström 2001: 137).
5. *Expansive learning*: "Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort. An expansive transformation is accomplished when the object and motive of the activity are reconceptualised to embrace a radically wider horizon of possibilities than in the previous mode of the activity" (Engeström 2001: 137).

Change laboratories

Key to the CHAT methodology are "change laboratories" (Engeström, Miettinen & Punamäki 1999). These are workshop-like events where participants collectively identify contradictions in their activity systems. In this manner, they explore interventions that would align those systems so they can better achieve their object. SCAP took it as axiomatic that each of our pilot sites had misalignments that could be identified and re-aligned so that they could operate more optimally. For many change lab participants, the CHAT approach offered a useful method for comprehending the complexity of their scholarly communication ecosystems, inspiring them to look beyond technical

(tools-oriented) solutions to their challenges and to consider them from the vantage of each node and connection.[17] The knowledge we gained from our change labs was contextualised through data from our research strands. Together these generated rich descriptions of the conditions under which scholars conduct and communicate research.

Research components

SCAP's research comprised three interlinked components: expansive learning and change/advocacy; research strands; and implementation initiatives. These components are shown in Figure 2.2. With CHAT at the centre, the four research strands are listed on the right, the four implementation initiatives are listed on the left and the expansive learning element connects the two at the bottom. But as the arrows show, these were mutually-constituting components, reflexively influencing each other as they progressed.

CHAT

Implementation

University of Botswana
– Departmental content profiling initiative
– Department of Library and Information Studies, Faculty of Humanities, ORD, UBRISA repository (Library)

University of Cape Town
– Content metadata and faculty repository
– Southern African Labour and Development Research Unit (SALDRU), OpenUCT Initiative, Centre for Educational Technology, Information and Communication Technology Services, Research Office

University of Mauritius
– Profiling Academics Online initiative
– Faculty of Science, Centre for Information Technology and Systems, Office of the Vice Chancellor, Public Relations Office

University of Namibia
– Faculty content profiling initiative
– Faculty of Humanities and Social Sciences, UNAM Press, Library, Computer Centre, Research and Publications Office, Pro-Vice Chancellor Academic Affairs

Research

1. Research communication practices
– Surveys
– Interviews
– Observational Studies
– Research Logs

2. Values
– Academics
– Librarians
– University managers

3. Exploring impact
– Values
– Reward systems
– Altmetrics

4. Cost analysis
Costs and benefits of open scholarly communication

Change/Advocacy ◄► Expansive learning

Figure 2.2 Diagrammatic overview of the SCAP operational approach

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17   SCAP's adoption of CHAT was unusual in that our study sites did not specifically request interventions around scholarly communication, as typically occurs with CHAT/change lab engagements. In fact, many participants only became aware of the contradictions in their activity systems by exploring them with us.

Expansive learning and change/advocacy

The expansive learning component involved SCAP's use of CHAT with its emphasis on conscious stimulation of and reflection on the scholarly communication activity system amongst staff members in each study site. This was implemented through iterative change laboratories, workshops and advocacy work. These CHAT "techniques" animated and integrated the other two components: the research strands that examined the scholarly communication ecosystem in each site and the technology implementation initiatives.

This research component involved rigorous documentation of the participatory processes involved in the change laboratories and site visits. SCAP tried to incorporate the analytical power of CHAT into every activity and interaction. But most pilot site participants' experience of CHAT was most keenly felt in the change laboratory workshops. It was on those occasions that we explained the CHAT methodology and how its discursive tools could help us to elucidate the pilot site's scholarly communication activity system and develop an intervention that improved its functionality.
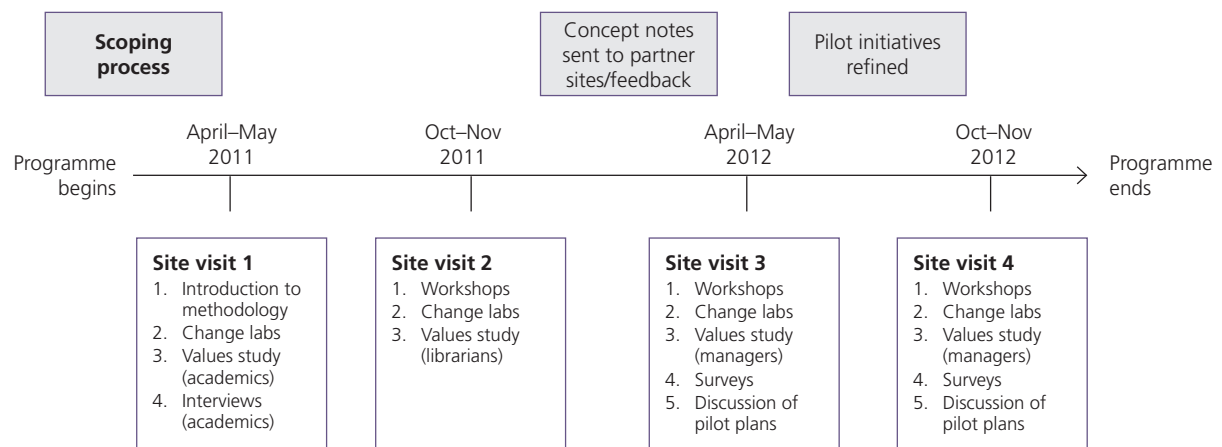
Figure 2.3 Overview of SCAP research and implementation schedule

At each university, the change lab participants were typically members of the relevant pilot site, although university managers and librarians also attended sessions. Numbers varied between seven and 13, with a small core who participated throughout and others who came and went. The change lab workshops were full-day sessions, contributing to a broader research and advocacy programme during the PI team's week-long site visits. Figure 2.3 shows when we conducted the change labs and how this coincided with other research we were carrying out at the host institutions.

In the first change lab workshops we held, we started by introducing the participants to the idea of scholarly communication as an activity system. We explored CHAT principles, discussed the virtues of the CHAT triangle as a heuristic and analytical device and asked participants to identify areas where there were challenges or tensions in their scholarly communication ecosystems.

In the second workshops, we started populating the activity system triangles with the information given by the pilot participants, identifying the subject, object and outcome of the system, as well as the tools, rules, community and division of labour. Once all of the fields were populated, we started identifying the challenges, contradictions and opportunities within the activity systems so that we could understand where misalignments were occurring and how we could re-align them through an implementation initiative. The data from these workshops gave us a lot of the information we required to write up concept notes for the various implementation initiatives that we ended up pursuing. While most participants initially found this CHAT triangle process awkward, they quickly began to see its descriptive and explanatory power; however, once we established how each node was impacting the others, it allowed them to see their work activity in a different light. As an example, Figure 2.4 shows a completed triangle for UoM FoS.

In the third set of workshops we re-presented the fully populated activity system triangles so that participants could amend and verify them. The PI team also shared the concept notes for the implementation initiatives, eliciting useful feedback in the process.
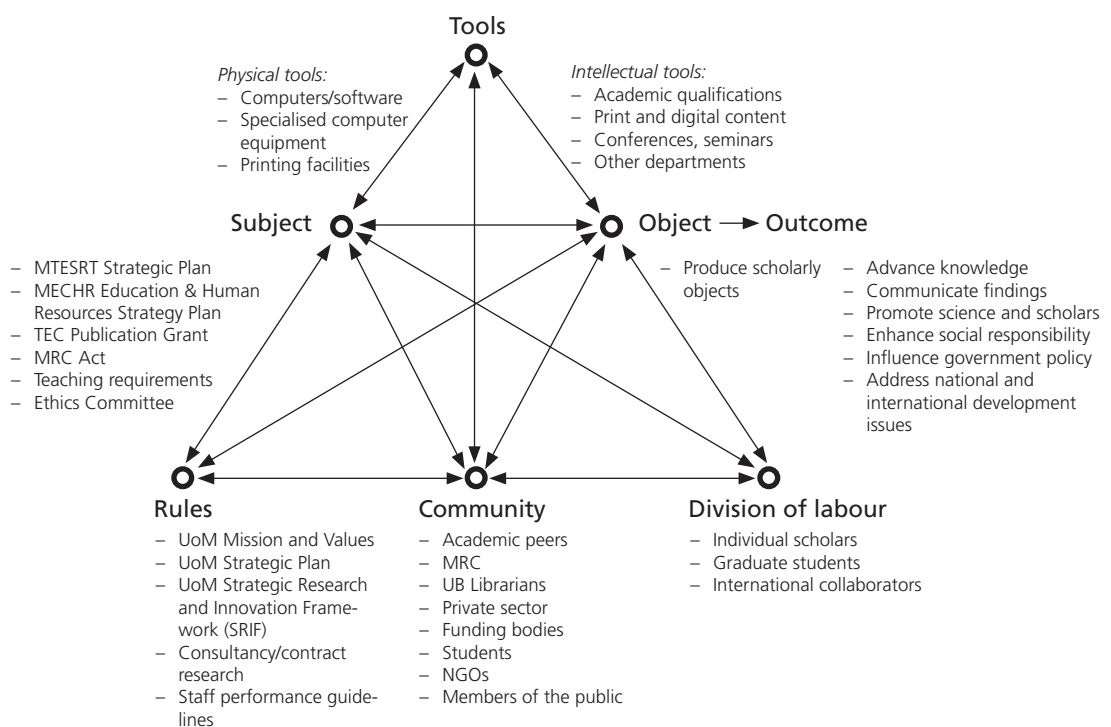
Figure 2.4 UoM FoS activity system triangle populated with change laboratory material

In the fourth and final set of workshops the PI team presented preliminary findings from the research strands, which enabled a "mirroring" process (i.e. the final stage of the expansive learning cycle implicit in the CHAT process). By "reflecting" scholars' activity systems to them in a descriptive and analytical fashion, we were able to secure crucial feedback from them for eventually arriving at our concluding findings (presented

in Chapter 8). During that final visit, the participants also assessed the progress of the implementation initiative.

The change laboratory process provided significant data on each site's scholarly communication activity system and proved to be an invaluable forum for engaging with academics, librarians and managers.[18] For many, our workshops provided a much-needed space for participants to be self-reflexive about their scholarly communication activity. A number also took advantage of the episodic attendance of senior managers to share their (often critical) perspectives with administrators with the clout to change policy.

As part of the expansive learning cycle, in addition to the change labs that we conducted, we collected institutional data through the many meetings, conversations and informal interactions we had with institutional stakeholders during our site visits.

Research strands

SCAP's research revolved around four strands: research and communication practice, values, impact and costs. Here we discuss the processes employed to carry out this research and how we integrated the materials in our analysis.

Research and communication practice

The primary question driving our research was "what is the current state of scholarly communication in Southern African universities?" To answer this, we utilised multiple research mechanisms to gather data – namely surveys, interviews, day-recalls, personal observations and informal conversations.

Because of the transformations taking place in the field of scholarly communication – due to changes in global research activity (Cooper 2009, 2011; Etzkowitz 2004; Gibbons 1997; Gibbons *et al.* 1994) and Web 2.0 technologies (Palmer 2005; Procter *et al.* 2010; Tenopir 2003; Thorin 2006; Weller 2011) – we felt it was important not only to establish baseline indicators for scholars' activities, but to examine their day-to-day practices.

We viewed the "practice turn" in the social sciences as offering us an approach that was compatible with our CHAT methodology in that practices can be seen as "arrays of human activity" that are materially mediated and "organised around shared practical understanding" (Schatzki 2001: 2, quoted in Palmer & Cragin 2008: 169).

We also built a "research and dissemination cycle approach" into our data collection instruments so that we could understand our research subjects' scholarly communication practices at each stage of the research and dissemination process. By breaking their activity down into discrete elements of a larger cycle, we believed we could identify how disciplinary norms, output genres, funding circumstances and personal values played into their research and communication practices. It would also help us to identify possible contradictions in their activity systems, while pointing to potential opportunities

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18   All of our change lab workshops, seminars and formal meetings were digitally recorded and fully transcribed.

for improvement. Furthermore, as Palmer (2005: 1140) states, "in the cycle of scholarly communication scholars play the role of both consumer and contributor of intellectual works within the stores of recorded knowledge." Hence we utilised Czerniewicz's (2013) research and dissemination cycle model because it incorporates an understanding of how open access and Web 2.0 technologies are transforming scholarly communication opportunities (which we discuss in Chapter 5).

In the context of that cycle, we also explored what enables or constrains the flow of scholarly communication by seeking to understand what difficulties scholars may experience with regard to access to and searching for scholarly work, as well as their dissemination choices.

This research strand therefore included quantitative and qualitative methods of data collection, aiming to produce "thick descriptions" of these practices in each of the study sites. We hoped to obtain "insider accounts" of African scholars' day-to-day practices as they went about producing, accessing and sharing research.

The first method that we used in this strand was a survey that was prepared with reference to the questions and findings from a number of international scholarly communication studies and surveys (Houghton, Steele & Henty 2004; Maron & Smith 2008; Palmer, Teffeau & Pirmann 2009; Procter *et al.* 2010; Rowlands, Nicholas & Huntingdon 2004; Rowlands & Nicholas 2006). In particular, we drew on Houghton, Steele and Henty's (2004) study, which focused on three key areas of research activity: communication and collaboration; information search and access; and dissemination and publication. We adapted these, however, to take account of our focus on the stages in the research cycle. The survey included the following categories of questions:

- General information
- Research and dissemination activity
- Collaboration and communication
- Information access and searching
- Forms of Web 2.0 engagement
- Faculty attitudes and support

At each university, the SCAP research assistant administered the survey to between 28 and 50 academics in the relevant faculties. The data was coded and cleaned, entered, and analysed within the PI team. The results are reported in Chapter 5.

The second research instrument we used was a semi-structured interview aimed at gaining a more granular feel for day-to-day research practices and what enabled or constrained them. The interviews covered:

- a discussion about their answers to the survey form
- questions on the individuals' general background and history
- narratives of three recent research projects or pieces of research that they had undertaken.

At the same time, these interviews sought to account for the social and organisational infrastructure within which research projects unfold, in particular the nodes in the activity system. In these narratives, academics were encouraged to focus on the stages in the research cycle, such as:

- how the research started and what motivated it
- what it consisted of
- what enabled or constrained the production of outputs from the research
- what forms of interaction and networking were involved
- the uses of Web 2.0 technologies
- dissemination choices (journal articles or other genres)
- feedback on these outputs.

The CVs of the interviewees were collected, analysed and viewed in relation to the scholarly "shadows and footprints" research undertaken as part of the third research strand.

The third research method we used in this strand was the "day-recall". This involved visiting a sample of the interviewees 24 hours after the first interview and asking them to narrate everything work-related they had done in those 24 hours, in order to elicit specific critical incidents that might shed light on what enabled or constrained research communication. In some cases this was repeated a second time.

At each university we conducted between five and seven "research and communication practices" (RCP) interviews each lasting about an hour-and-a-half. The interviewees were all academics who were seen to be active researchers and who had some understanding of open access issues and of the affordances of Web 2.0 platforms for scholarly communication.

Table 2.2 Total number of participants in SCAP's formal research processes

Interviewees/participants	UB	UCT	UoM	UNAM	Totals
Survey respondents	29	28	30	50	137
Change lab participants [1/2/3/4]	12/7/11/11	10/10/7/8	13/8/4/7	13/9/11/11	152
Values interviews (academics)	13	6	14	13	46
Values interviews (librarians)	5	4	5	3	17
Values interviews (managers)	5	5	5	5	20
RCP interviews (academics)	5	6	6	7	24
Totals	**98**	**84**	**92**	**122**	**396**

Values

The second strand of our research explored the values motivating university academics to conduct and communicate research. Drawing inspiration from a number of recent attitudes and behaviours studies focusing on academics in the global North (Archer 2008; Harley *et al.* 2007; Harley *et al.* 2010; JISC 2012; King *et al.* 2006; RIN 2009, 2010; Rowlands & Nicholas 2005), we sought to understand the foundational values driving research production in the Southern African context.

At each university, this entailed the PI team conducting focus group interviews with between six and 14 academics, individual interviews with between three and five librarians and individual interviews with five managers. This qualitative research was conducted during the course of the recurring site visits, with the focus group interviews lasting about an hour-and-a-half each and the in-depth individual interviews lasting between 30 minutes and one hour each. We recruited informants through convenience sampling, typically relying on our research coordinators to identify and contact the appropriate people for SCAP to engage.

For each category of university personnel interviewed, SCAP created a set of standardised questions (which were also asked at the other institutions), prompting respondents to reflect on their own and their institutions' research values. Through this, we were able to gather the data necessary for comparing scholars' values across the four universities. Below is the list of questions that interviewees were asked:

To academics (in focus groups):

- Why do you currently do research?
- Why would you (ideally) want to do research?
- How much does our African context influence these motivations?
- Are there different motivations driving basic and applied research? Do you feel that these motivations change in a developing context?

To university librarians (individually):

- What role do you currently play in the scholarly communication process?
- What role would you (ideally) like to play in that process?
- Does the African context influence the role you currently play, or would like to play, in this process?

To university managers (individually):

- Why do scholars at your institution conduct research?
- How does the African context impact their research motivations?
- What challenges do they face in fulfilling their motivations?

Through these questions, we sought to understand not only the values animating the production of local research, but how they were shaped by the African context and its various challenges and opportunities. The questions also formed the basis of sustained discussions concerning a variety of topics that organically arose through the respondents' reflections, such as university rewards and incentive structures, national development imperatives and consultancy work. This material generated data that was useful not only to our values research but to the other research strands as well.

In addition, we were able to obtain values-related information from our change laboratory workshops, surveys, day-recall sessions, interviews, implementation initiatives and personal observations gained through casual conversations and on-site experiences. The

fact that we were able to draw from multiple data sets, each with its own approach, was crucial for allowing us to get a comprehensive and complex view of scholarly values. The results of these values analyses are discussed in Chapter 5.

Impact

Academic research is one of the central concerns in a new, more accountable global academic environment. Traditionally conceptualised as peer-to-peer communication, the impact of a scholarly research object used to be tied solely to its importance in the academic community and not its importance in terms of socio-economic development. This has partly been a technological issue. Until recently the only quantitative measure of research impact was the Thomson Reuters ISI/WoS Impact Factor.[19] It was also due to an understanding of university practice as separate from civil society and industry, and thus subject to a different set of rules. The professionalisation of the sector has brought with it interest from funders and governments about the demonstrable returns from investing in higher education (Power 1997; Raza 2009; Shore & Wright 1999; Strathern 2000).

Technological advancement in tracking tools now permits institutions to track a range of research object performance metrics, from traditional citation counts to downloads, bookmarks, page views and social media reports. Using these new methods, known as Altmetrics (alternative metrics), it is possible to obtain not just metrics and statistics, but to develop usage narratives that show how academic research is being used by civil society, making it possible to demonstrate the value of research to non-academic audiences and to track how it is being used. This information could help institutions to focus on refining their engagement with society, identify areas in which they are succeeding and determine where they could provide the most value to the community.

In order to experiment with Altmetrics in Africa, we initiated an output tracking exercise at our four study sites. Data was collected over a six-month period (May to October 2012) by research assistants at each site who were asked to acquire lists of publication outputs from their respective institutions. The data was examined to identify potential "impact narratives" as well as to identify any interesting or unusual characteristics.

This resulted in two policy briefs spearheaded by Cameron Neylon, a SCAP advisor:

1. Neylon C, Willmers M & King T (2014a) *Illustrating Impact: Applying Altmetrics to Southern African Research*. Scholarly Communication in Africa Programme (SCAP) Brief No. 1 for the International Development Research Centre, January 2014, University of Cape Town
2. Neylon C, Willmers M & King T (2014b) *Impact Beyond Citation: An Introduction to Altmetrics*. Scholarly Communication in Africa Programme (SCAP) Brief No. 2 for the International Development Research Centre, January 2014, University of Cape Town

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19   Thomson Reuters, Journal Citation Reports, at: http://thomsonreuters.com/journal-citation-reports/

Cost-benefit

Our fourth research strand focused on the costs of scholarly communication in the African context, as well as the implications of moving to an open dissemination model. We saw this as a useful research effort because we wanted to be able to reduce a technologically and ethically complex proposal into a potentially simpler set of economic denominators that would allow institutions to judge the financial value of such a transition. We understood that for many institutions open access would only be of interest if it were cost-effective.

We explored a number of economic methodologies to help explicate the costs and benefits of African scholarly communication, namely cost-benefit analysis, cost-effectiveness analysis and cost-utility analysis. The initially envisioned process was to uncover institutional financial data during the period October 2011–October 2012. However, the PI team, in consultation with the relevant RCs, discovered that institutional financial reporting structures were insufficient for providing the granular detail required for any cost-utilising analysis. Moreover, data confidentiality concerns would have prevented it from being made available even if scholarly communication had been traceable through institutional reporting systems.

We therefore abandoned this line of research (because it was beyond the scope and capacity of the PI team and our partner universities) and instead focused on assessing the relationship between national development priorities, university mission commitments and open access strategies. This culminated in the production of an advocacy document led by Alma Swan, a SCAP advisor, which showed how open access could support African institutions' desire to contribute to national development imperatives while preserving their intellectual patrimony through digital profiling and curation strategies:

• Swan A, Willmers M & King T (2014) *Opening Access to Southern African Research: Recommendations for University Managers*. Scholarly Communication in Africa Programme (SCAP) Brief No. 4 for the International Development Research Centre, January 2014, University of Cape Town

Implementation initiative

SCAP's research design called not only for the collection of data from our pilot sites, but for these sites' active stimulation through customised implementation initiatives (or "interventions") that sought to improve the state of scholarly communication within the sites. Five principal assumptions underpinned these initiatives. They would:

1. be treated as experiments
2. address a challenge articulated by project participants in pilot sites and other institutional stakeholders
3. be publishing-oriented, addressing content profiling and dissemination through new tools and technologies
4. utilise open approaches (including open source software and publishing platforms) wherever possible

5. yield insights that could be extrapolated to the rest of the institution, developed in line with current institutional strategy, e-infrastructure and international standards and protocols around interoperability.

SCAP scoped and fulfilled the implementation initiatives during our four site visits. The first visit aimed to surface the contradictions in the scholarly communication ecosystem, while the three subsequent visits sought to create consensus around the nature of the initiative, identify stakeholders and policy frameworks, and implement the agreed-upon pilot process.

While the formulation process was participatory, the PI team played a considerable role in interpreting and translating the desires of informants into a feasible intervention. This was due to two factors. First, while informants had a clear sense of institutional challenges, they were often unable to articulate desired solutions because they were unaware of the new technologies that might overcome these challenges. Second, the PI team also had the responsibility of protecting the funder's interests and ensuring that the implementation activity adhered to open access principles.

At each pilot site, after identifying its scholarly communication challenges, needs and desires, our intervention focused on improving the visibility of the pilot site academics by either enhancing their capacity to build online profiles or establishing a useful workflow process for getting their materials onto their subject and institutional repositories. The results of this process are detailed in Chapter 6.

Integration and analysis of data

Through these multiple research strands, implementation initiatives and other information-gathering instruments, we were able to obtain a substantial amount of data for answering our two key research questions. To analyse the data, we utilised the inductive "grounded theory" approach and the "constant comparative" method. The process generally went as follows (although this was not uniform across all data sets):

- Reduce inputs to text (i.e. transcribe change labs and interviews, tabulate surveys).
- Identify and extract assertions from texts (listed initially according to research strand and university).
- Tag assertions with an intuitive notation system that allows us to keep track of their speaker, context of production and university affiliation.
- Code assertions according to thematic categories (which are derived organically from the data).
- Analyse (in narrow focus) the meaning of assertions in relation to each other within their thematic category, research strand and university context.
- Frame (in widening focus) implications of assertions from one theme with those of others, helping them to make sense of each other, but still within a given strand and university.
- Integrate analytical insights from research strands on a particular university (including from secondary literature and personal observations) to gain a nuanced

and comprehensive understanding of the institutional scholarly communication ecosystem.

- Compare integrated analyses from each university with each other, revealing similarities and differences in various aspects of their scholarly communication ecosystems, thereby yielding a clearer picture of regional communication practices.

In between these steps, we also stepped back and embarked on a more deductive process, which involved checking our data against key concepts and insights in the relevant secondary literature, as well as exploring "hunches" based on immersion in the sites and the data, which were then tested against the developing themes and frames. This analytical process was largely carried out by the PI team, but once key insights and preliminary findings had been established, they were shared with participants in the pilot sites – especially the RCs – so that they could interrogate, amend or verify them.

Conclusion

Our methodology ultimately combined a number of approaches so that we could obtain data at our pilot sites from multiple angles. We realised early on that no single approach would yield the detail we desired from the institutions; thus, we took multiple, overlapping approaches to the sites so that we could understand them in a comprehensive way.

The first element defining our multifaceted research approach was the fact that we engaged with the pilot sites as "case studies": that is, each of them comprised one of four sites in our broader research effort. Researching these different sites using similar methods and obtaining comparable data (Trotter *et al.* 2014a, 2014b, 2014c, 2014d) meant that they were able to contribute to this synthesis study which offers a view of scholarly communication spanning the Southern African region. Yet we never forgot that each of these sites bore their own unique histories, traditions and practices; therefore we sought to gain nuanced understandings of each site so that, when we compared them, we were able to grasp precisely where their similarities and differences were located.

The second element of our approach was our use of the CHAT methodology as our primary analytical device. This influenced not only the metaphors that we utilised to assess these sites – thinking of them as activity systems (or ecosystems) – but also the style of engagement that we had with participants. We deployed an important CHAT data-gathering device, the change laboratory, which allowed us to work with university stakeholders to identify contradictions in their scholarly communication ecosystems. In this way, participants were not simply research subjects, but were co-partners in our quest to understand and change their reality. Their "buy-in" to this process was critical to the success of the project as they took a degree of ownership in it.

The third element of our approach was that we were able to obtain a quantitatively rich description of our pilot sites, primarily through the 25-page survey that we had participants fill out, but also through various change lab exercises that we deployed during our site visits. This formed a crucial "objective" layer of data that provided a foundation for cross-comparison between sites.

The fourth element of our approach was that we were also able to obtain a qualitatively rich understanding of these activity systems through our interviews, day-recall sessions, conversations and observations during our four rounds of site visits. We believed that this layer of ethnographically informed information was crucial for us being able to understand the complexity of these sites.

The final element of our research approach, which ended up yielding a number of our more subtle and durable insights, was our use of implementation initiatives to stimulate the pilot sites' activity systems. Through these, we experienced first-hand the bureaucratic, political, social and technical challenges involved in operating in those environments. By bringing money and resources into our engagement, we initiated a much more complicated set of relationships than if we had simply operated as a research programme. This often led to significant discomfort on both sides, but it helped to reveal the "actual", as opposed to the simply "discursive", commitments that both sides brought to the relationship.

Chapter 3
The Southern African
university context

In this chapter, we analyse the broader contexts shaping scholarly communication activity at the Universities of Botswana, Cape Town, Mauritius and Namibia. We start by detailing the general conditions of higher education in Southern Africa so as to grasp how the region both reflects and refracts conditions at these different universities. Then we profile the major features of each university's national and institutional context, focusing on history, demographics, funding, human capital, infrastructure, research and management. This three-tier nested approach – analysing the regional, national and institutional settings – will also allow us to locate more precisely which contexts shape the different elements of our research sites' activity systems, a point that will be crucial for the kinds of interventions we later recommend. Because this chapter includes a lot of information, readers should feel free to skip to the sections they believe will be most helpful for understanding the later more analytical chapters. We have included this thick description here so that readers can have the necessary supporting information for grasping the complexity of this nested ecosystem. Thus it can be read now – drawing down from the macro to the micro – or consulted later as needed.

Southern Africa

Southern Africa (here defined as the countries within the Southern African Development Community, or SADC) is home to 14 countries[20] and 253 million people. The region hosts 54 universities and makes a significant contribution to continental research production (though only a marginal one to the global literature). As the four SCAP study sites were all located in Southern Africa, it is valuable to consider the region's specific context, both to avoid the all-too-common problem of writing about "Africa" as an undifferentiated, essentialised monolith and to develop a more concise understanding of the geopolitical environment in which the four study sites are located.

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20 SADC member states: Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

Southern Africa spans South Africa in the south to the Democratic Republic of Congo (DRC) in the north, and includes the south-eastern Indian Ocean islands of Madagascar, Mauritius and Réunion. It contains the continent's biggest economy (South Africa), its most innovative economy (Mauritius[21]) and the four most unequal countries in the world (Namibia, South Africa, Botswana and Lesotho[22]).

History

Southern Africa follows the general pattern of post-colonial tertiary education development, with the significant exception of South Africa. While the majority of the region's universities were established after the 1960s, many of South Africa's most highly ranked universities were established in the first two decades of the 20th century. As such, the country has been a centre of academic excellence and attracts many students from throughout the region. These universities were able to avoid various crises in sub-Saharan African higher education due to the presence of its own national funding capacity, a fact that has contributed to South Africa's dominance in regional research production.

Demographics

Southern Africa's tertiary gross enrolment rate was 6.3% in 2012, comprising 1.3 million students, 51% of whom were female (Wilson-Strydom & Fongwa 2012: 19). Within the region the gender profile is mixed: Lesotho, Mauritius, South Africa, Namibia and Swaziland follow the global trend of higher female enrolment, while the other SADC countries conform more to the general African trend for greater male participation in tertiary education. These figures are comparable with African higher education enrolment in general. The majority (84%) of tertiary education is based on contact-tuition (Wilson-Strydom & Fongwa 2012: 18) and is largely urban in nature.

Funding

Within the region there is a large differentiation in terms of national expenditure on education, which is not directly correlated with educational outcomes. Lesotho, for example, spends 13.4% of its GDP on education and fares second "in respect of the availability of scientists and engineers for research and development" (Richards 2008: 4) yet ranks lower than South Africa in terms of innovation, in 117th place vs South Africa's 54th (Global Innovation Index 2012).

Research funding in the region is generally low, and heavily dependent on international funding agencies:

> *A very substantial 42% of all respondents from SADC (RSA excluded) indicated that they source between 70 and 90% of their research funding from overseas compared to only 6% of South African respondents. The responses very clearly*

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21 Global Innovation Index 2013, available at: www.globalinnovationindex.org/content.aspx?page=data-analysis

22 Kevin Lincoln (2011) The 39 Most Unequal Countries in the World, *Business Insider*, available at: www.businessinsider.com/most-unequal-countries-in-the-world-2011-10?op=1

show the dependence of SADC scientists on international funding for their research; and conversely how little domestic funding is available for research. We should also point out that this picture is even worse if one keeps in mind that the scientists in our sample were identified because they are the most active and productive scientists in their fields in their countries. (Mouton 2010: 23)

Excluding South Africa, which spends 0.9% of its GDP on R&D (DST 2013), the average regional expenditure is closer to 0.3%. Institutions themselves often struggle to provide sufficient funding for their academics' proposed research budgets, contributing to short-term, introspective and derivative research work.

In such a funding environment, consultancies offer an attractive alternative for researchers struggling with inadequate institutional and national funding systems, and "more than two thirds of all academics in the fourteen SADC countries regularly engage in consultancy" (Mouton 2010: 15). As with sub-Saharan Africa in general, the influence that consultancy work exerts on Southern African research agendas can be seen in both positive and negative lights – offering on the one hand the opportunity to conduct well-funded and relevant research, while on the other taking time away from basic or theoretical research, and locating executive control over the region's research agenda outside of the academic community itself (Mamdani 2011a; Mkandawire 2011). Even national governments have comparatively little control over the shape of public science (Mouton *et al.* 2008).

Human capital

The "brain drain" problem so common in sub-Saharan Africa is also felt in Southern Africa, but with the caveat that, along with international emigration, there is also a good deal of intraregional migration, mostly to South Africa. Student migration can be as high as 87% and 65% in Botswana and Namibia, respectively, while "South Africa has the highest inbound mobility rate with nearly 50,000 foreign students studying in the country in 2005" (Mouton 2010: 20).

The brain drain phenomenon has historically been driven by multiple factors, including the declining quality of life across Africa from the late 1970s to the early 1990s, the lack of knowledge-intensive industry to provide desirable employment, the deterioration of the higher education sector, political instability and the lack of local postgraduate programmes (Barclay 2002; Mouton *et al.* 2008).

Infrastructure

Although SADC has the "most pervasive regional terrestrial fibre network" (SADC 2012: 27) on the continent, its access to and use of bandwidth is relatively low compared to global standards. "An average of only 4% of the SADC region's population are internet users today" (SADC 2012: 21). "These generally low levels of internet penetration, are partly the result of the high cost of access, combined with low income levels, and the lack of fixed line infrastructure, combined with the relatively short period that lower cost wireless internet services (mainly 3G and WiMax) have been available in major urban

areas" (SADC 2012: 22). Furthermore, with regards to the average growth in internet penetration, the SADC region is "falling behind compared to the rest of the world (although it is ahead of the average for Africa as a whole)", with the "region being almost 10 years behind the world average" (SADC 2012: 22).

In contrast to the low level of internet users, mobile telephony usage rates are quite high. "Encouraged by the early introduction of prepaid services (which now account for 80–90% of subscribers in the region), mobile uptake stood at an average of 60% of the population in 2010" (SADC 2012: 18). However, this figure "obscures fairly large variations (about 5 times) between SADC Member States, with the DRC and Malawi at only around 20% penetration while Seychelles, Botswana and South Africa are over 100% (due to the use of multiple SIM cards)" (SADC 2012: 18).

While the universities that we profiled enjoyed reasonable access to the internet and could enhance their scholarly communication activities even with their present level of access, the low levels experienced by other members of the population decreased the educational potential of the internet, especially at the basic education level.

Research

Although Southern Africa research production is impressive by continental standards, most countries in the region still produce fewer than 1,000 ISI/WoS-ranked publications per year, with only Tanzania and South Africa producing more prolifically (Kotecha, Walwyn & Pinto 2011). Productivity per full-time-equivalent (FTE) researcher varies across the region, ranging from Namibia and South Africa producing close to 0.8 WoS-ranked publications per researcher per year and Botswana and Zimbabwe averaging close to 0.6 per researcher per year, to the DRC, producing very little ranked research (Kotecha, Walwyn & Pinto 2011). Even the higher performing countries in the region underperform relative to the developed-country average of 1.2–1.5 WoS articles per FTE researcher per year. Within the region, South Africa dominates: of the 11,000 research publications reported in the region in 2009, some 9,000 were produced by scholars in South Africa.

PhD qualifications are another metric of national research development. In 2010, the region produced 1,546 doctorates, of which only 125 were outside South Africa, which "accounts for 89% of PhDs in the region" (Kotecha, Walwyn & Pinto 2011: 12). Aside from Mauritius and South Africa, which produce between 0.3 and 0.4 PhDs per FTE researcher per year, the production of new doctorates is very low. In general, the education profile is biased towards undergraduate studies, as explained by Wilson-Strydom and Fongwa (2012: 38):

> *The regional graduation profile is even more heavily skewed towards undergraduate qualifications, with 79% of graduations being at the undergraduate level, 15% at postgraduate level, 6% at the masters level and only 1% at doctoral level. If the South African data are removed, the proportion of undergraduate graduations increases to 88%, postgraduate graduation below masters level is 5%, and masters and doctoral qualifications together represent 5% of the total.*

South Africa's dominance in PhD production is partly due to internal intellectual migration. As many universities lack capacity for postgraduate supervision, South Africa is an attractive destination for regional postgraduate students. As PhD qualifications are strongly correlated with research production (Cloete, Bailey & Maassen 2011), the region's lack of endogenous PhD development is therefore a negative factor in intensifying research, especially the development of local epistemologies.

Management

In many Southern African countries, the establishment of national universities coincided with independence and was one of the markers of a functioning, independent nation-state. In this environment, "the major purpose for establishing universities in these countries was, and still is, for the institutions to play a pioneering role in addressing problems of poverty, social disorganisation, low production, hunger, unemployment, illiteracy, disease, that is, the problems of underdevelopment" (Mosha 1986: 1).

As such, universities (especially in single-university countries) have always been strongly aligned with national governments. Academic freedom was even seen in some cases as "a petty bourgeois claim, a sort of luxury that poverty- and crisis-ridden societies cannot afford" (Sall 2001: 1). Yet this remains a situation in flux, as academics continue to voice concerns about the perceived detrimental effects of government interference in the academic enterprise, calling for universities to exert greater control over their own work.

With this regional setting in mind, we can now focus on each institution's context.

Table 3.1 Comparative national indicators

Indicator	Botswana	South Africa	Mauritius	Namibia
Population	2 million	51 million	1.3 million	1.2 million
Size	600,370km^2	1,221,037km^2	2,040km^2	824,268km^2
Public universities	2	23	2	2
Human Development Index	0.634	0.629	0.737	0.608
Gini Index	61	63.1	39	63.9
Gross National Income per capita	USD14,550	USD6,960	USD14,594	USD6,520

Table 3.2 Comparative university indicators[23]

Indicator	UB	UCT	UoM	UNAM
Academic staff numbers	877	2,200	260	718
Student enrolment	17,678	25,864	11.395	17,536
Student:staff ratio	20:1	12:1	32:1	40:1
International rankings				
Times Higher Education (THE)	--	113 (2012)	--	--
Quacquarelli Symonds	--	145	--	--
Shanghai Jiao Tong University	--	201–300	--	--
Webometrics	3,127 (43rd in Africa)	390 (2nd in Africa)	3,714 (59th in Africa)	3,514 (54th in Africa)

23   Webometrics Ranking Web of Universities, Africa, available at: www.webometrics.info/en/africa [accessed 7 November 2013]

University of Botswana

Botswana is a sparsely populated country with just over two million people. One of the poorest countries in Africa at the time of its independence in 1966, it has since shown consistently strong rates of economic growth, driven primarily by mining and cattle farming, but increasingly diversifying into the finance, service and manufacturing industries. Today, Botswana has the highest credit rating in Africa,[24] the lowest rate of corruption on the continent[25] and a history of strong representative democracy (Sebudubudu & Botlhomilwe 2012). Nevertheless, it also experiences a highly unequal distribution of wealth and an unemployment rate of 17.8%.

As the country's flagship university, UB "is closely involved in the national development process of Botswana," mainly through teaching and "the research and development, consultancies and information services which they undertake."[26]

History

Since independence, Botswana has followed an unusual trajectory in Africa, with an unbroken history of democratic governance, no military or ethnic unrest and no warfare with foreign countries (Sebudubudu & Botlhomilwe 2012). After independence, the nation enjoyed a long and sustained period of high growth that has led to its emergence as a middle-income country. As such, it has avoided some of the negative consequences of civil unrest such as population displacement and infrastructural destruction that have set back development in other parts of the continent. However, it has not escaped the ravages of the HIV/AIDS pandemic that is prevalent across southern Africa.

The history of higher education in the country is largely synonymous with UB, which began operating in 1964 as the University of Basutoland, Bechuanaland and Swaziland. In 1982 UB became an autonomous institution, steadily growing from four to eight faculties (Malete & Kobedi 2012). The university has for most of its history been a teaching-oriented institution, though it has a number of well-known research centres which attract international scholars and produce a large portion of the university's research output.[27] At the time of writing, UB was the largest single tertiary education provider in the country, though the number of private higher education institutions has also grown considerably over the past two decades.

Demographics

There are close to 47,000 students of higher education in Botswana (TEC 2012: 2), of which 34,000 go to public HEIs and 13,000 go to private HEIs. This amounts to a

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24   *The Guardian* (2013) Credit ratings: how Fitch, Moody's and S&P rates each country. Available at: www.guardian.co.uk/news/datablog/2010/apr/30/credit-ratings-country-fitch-moodys-standard [accessed 3 June 2013]

25   According to Transparency International's Corruption Perception Index of 2012, Botswana ranks 30th out of 174 nations surveyed (tied with Spain) and 1st in Africa. In comparison, Mauritius ranks 43rd internationally and 3rd in Africa; Namibia ranks 58th internationally and 6th in Africa; and South Africa ranks 69th internationally and 9th in Africa. See www.transparency.org/cpi2012/results

26   About UB, available at: www.ub.bw/content/id/1895/About-UB/

27   UB History, available at: www.ub.bw/content/id/1366/History/

gross enrolment rate (GER) of the 18–24 population of 16.4% (TEC 2012: 24), which compares to an 18% rate in South Africa and 45% in Mauritius (TEC 2013).[28] UB hosts 17,678 students, accounting for 40% of the higher education enrolments in the country (TEC 2012: 2).

Funding

Botswana spends approximately 20.2% of its national budget on education, amounting to 2.2% of the country's GNI (UNESCO 2012). According to the TEC (2012: 34), "the share of tertiary education expenditure is estimated to be around 4.1% of the GDP." The government provides full education subsidies to tertiary students from within Botswana, including costs of living and tuition, while international students pay for all of their expenses.

For research, the government proposed the creation of a National Research Council in the Botswana Long Term Vision 2016 (PTG 1997) for coordinating national-level research funding. However, that body has yet to be established. Thus most national research funds come from the various governmental ministries and bodies, such as the Tertiary Education Council (TEC), which provided "P10 million [USD1.2 million] for tertiary research funding in 2011" (TEC 2012: 47).

The bulk of publicly sourced funds for research at UB come from the university's internal research budget (which is almost totally derived from government subvention). Over the past years, with the university's decision to move from being a teaching-oriented to a research-oriented institution, UB faculties and departments have dramatically increased their research budget requests from P3.5 million (USD424,000) in 2008 to P7.5 million (USD909,000) in 2009. However, the actual amount distributed increased only from P1.6 million (USD194,000) to P2.6 million (USD315,000).[29] According to the university (UB 2008d: 23), "during the financial year 2008–2009, internal research funding was more than doubled to P3.5 million, and the budget for 2009/10 allocates P4 million."

Though the government provides the majority of research funding for the university, UB also receives research funds from external sources, such as the EU, UNDP, USAID, DANIDA, Microsoft and Debswana (UB 2008d: 23). To oversee the transfer of funds and promote research on campus, the Office of Research and Development (ORD) "currently supports over 150 active internally and externally funded projects" (UB 2008d: 24). However, many scholars and managers note that they would still like to see more research funding made available. For instance, the maximum for conference travel funds was P7,000 (USD850) while "UB funding, whose ceiling is P200,000 [USD24,000], is a very small amount for national researches."[30]

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28 Baboki Kayawe (2013) Botswana aims at 20% tertiary education intake. *MmegiOnline.* Available at: www.mmegi.bw/index.php?sid=1&aid=504&dir=2013/January/Thursday24

29 On 3 April 2013, the exchange rate between the Botswana Pula and the USD was 8.25 Pula per dollar (and 0.9 Pula per South African rand).

30 UB Deputy Director-Research, Dr Jose Jackson-Malete, quoted in Arnold Letsholo (5 May 2013) Stakeholders develop Manual for Botswana Research Fund. *Sunday Standard*, available at: www.sundaystandard.info/article.php?NewsID=16822

Human capital

According to Mouton (2008: 28), "available figures from Botswana indicate that over 90% of doctors, 61% of pharmacists, and 64% of the radiography cadre in the health sector facilities are expatriates. As a result the country is making great efforts to expand local training capacity and to increase the number of health students to address the problem."

Thus, over the last few years, UB has considerably expanded its postgraduate studies programme. The university enrolled 127 students for PhD studies in 2009/2010, out of a total postgraduate cohort of 1,499. The School of Postgraduate Studies at UB predicts that PhD enrolments will increase by 18% per year for the next seven years (Malete & Kobedi 2012). As of 2009/2010, 90% of UB enrolments were undergraduate and 10% were postgraduate (CHET 2012: 1).

On the staffing side, "in 2008/9 UB's permanent staff were comprised of 59% PhD holders and 41% masters holders" (CHET 2012: 12). However, the university has been experiencing challenging staff shortages. In 2011, with an academic staff cohort of over 800 personnel, there were still 163 unfilled posts (UB Academic Staff 2012). Yet there were nearly 2,000 support staff, many of whom were perceived to cost the institution disproportionately to the value they provided. Attrition of staff to overseas institutions and to the private sector has been particularly worrying, driven by both more attractive wages and low morale of academics in the institution (UB Academic Staff 2012: 24).

Infrastructure

Botswana has a dearth of fixed line telephony at seven lines per 100 residents, but a much higher rate of mobile telephony penetration, with 140 lines per 100 people. The use of internet services is dominated by urban populations while the rural areas receive little to no fixed-line bandwidth (Oladokun & Aina 2011).

At UB, bandwidth constraints remain a problem even as the university has considerably increased its investment in computer hardware. UB possesses an institutional repository, called the University of Botswana Research, Innovation and Scholarship Archive (UBRISA), which contained 936 digital objects as of June 2013. Moreover, UB "has experienced further growth in terms of construction of facilities such as the Faculty of Health Sciences, multidisciplinary offices, classrooms and lecture theatres which were completed by end of 2011/12" (MFDP 2013: 52).

Research

Botswana is one of the top producers of rated research in Southern Africa. According to Teng-Zeng (2008: 71), "Botswana produced 880 articles in ISI-journals between 1995 and 2004, an average of 88 per year (of which 95% were produced by UB staff)." However, it is also characterised by a low level of "international and even within-country collaboration as measured by co-authorship … The overall profile shows that academics are not typically involved in collaborative efforts. Whether this is due to historical reasons

(relative recent establishment of the University), or ICT-barriers, lack of funds or other factors, is not clear" (Teng-Zeng 2008: 71).

UB does not produce annual research reports (despite the use of the word "annual" in its periodic publications), thus it is difficult to obtain up-to-date information on research trends. However, this data from 2008 provides some sense of UB's research activities: in that year, "the Faculty of Science was leading with 134 refereed journal articles, followed by the Faculty of Education with 51 articles, after which Social Sciences and Humanities had 34 and 30 articles respectively. The Faculties of Engineering and Technology and Business had 13 and nine refereed journal articles respectively while HOORC had 28 refereed journal articles" (UB 2008b: 16).[31]

According to CHET (2012: 12–13), "the average ratio for the eight-year period is 0.12 [ISI-rated articles per year], which implies that Botswana's permanent academic staff produce on average one research publication every eight years" which is below the one-in-two years benchmark. Of course, this does not tally with scholars' own CVs, which show a far greater level of activity though their work may not be visible to the ISI/WoS.

Management

The UB administration operates according to what can be characterised as a "managerial" institutional culture (Bergquist & Pawlak 2008) in that it has a strong, centralised authority that wields power in a paternalistic, top-down fashion. However, a large portion of the academic staff want the university to re-focus on its "academic" mission because they believe that it has become too focused on the administration's interests. A number of scholars recently collaborated to write a critique of the managerial culture at the university. They conducted a survey amongst the academics and presented a report to the staff union, which contained multiple criticisms of the university's operations, namely the poor working conditions for academics, the top-heavy bureaucratic system and the growing deficit in academic staff numbers. The authors (UB Academic Staff 2012: 1) complained that:

> *the present structure has never been reviewed, instead it has grown bigger and bigger, which is why presently there are more than twenty five directors, numerous deputy directors, assistant directors and managers. The governance structure is top heavy and therefore contradicts the vision and mission of the University and is not properly aligned to its core business.*

In addition to this, the government plays an important role in guiding public institutions such as UB. For instance, the government appoints the university's vice chancellor and writes the national strategic development policies that the university must reference in planning its own goals and strategies.

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31   The report continues, "It should be noted that the data reflects reports made to ORD and it is undoubtedly incomplete, as reporting of research outputs is not mandatory for staff" (UB 2008b: 16).

Nonetheless, ORD helps scholars search for and find research funding opportunities, apply for funding, comply with funding requirements, commercialise research outputs[32] and develop long-term research funding strategies.[33] It also recruits post-doctoral fellows, sets up quality assurance frameworks for research plans, establishes partnerships for collaborative research, reviews and endorses funded project proposals and assists with other pre-award and post-award administration services.[34]

University of Cape Town

South Africa has the strongest economy on the continent, though unemployment is high (at roughly 25%) and it still performs poorly on the Human Development Index (0.629). Its considerable mineral wealth and industrial and manufacturing capacity have not resulted in uniform economic development, due largely to the country's history of racial discrimination. The result is a dual economy where considerable wealth exists alongside stark poverty, broadly delineated along racial, class, and urban–rural lines. South Africa's colonial, industrial and liberation history sets it apart in many ways from its regional and continental neighbours, while also tying them together. Bentley, Habib and Morrow (2006: 10) describe the country's ambiguous place in Africa:

> *Discussion of South Africa and Africa is always a delicate affair. South Africa is different in some respects to the rest of Africa, because of its history, its economy and the unusual composition of its population. The possibilities of mutual misunderstanding and resentment on both sides of the Limpopo are many. But South Africa is also an African country. Therefore it is legitimate to look at the rest of the continent and to consider South Africa as subject to many of the same forces and influences that have played and are playing on societies to the north.*

The country's higher education system substantiates this ambiguity, as portions of it (including UCT) resemble the well-resourced universities of the global North, while other portions face challenges that resemble those in other parts of Africa. South Africa's "differentiated" higher education system allows for these contrasting institutional realities, creating a diverse set of experiences for both scholars and students.

However, since the end of apartheid, the country has made great strides in opening higher education access to the entire South African population. According to the National Planning Commission (NPC) (2012: 317):

- Enrolment in HEIs increased from 490,494 students in 1994 to 837,644 in 2009 – a 71% increase.
- There have been significant demographic changes in student population: two thirds of university students were African in 2009 compared to a third in 1990.
- Student financial aid increased from ZAR10.3 million in 1994 to ZAR2.7 billion in 2010.

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32 The ORD Research Commercialisation Unit, available at: www.ub.bw/content/id/1856/pid/1740/ac/1/fac/8//Commercialization/
33 The Office of Research and Development, available at: www.ub.bw/home/ac/1/fac/8/
34 ORD Funding, available at: www.ub.bw/content/id/1952/pid/1740/ac/1/fac/8//Funding/

- University research output increased from about 5,500 [ISI-rated journal articles] in 2003 to 9,600 in 2010.

Contributing to this picture is the University of Cape Town, one of South Africa's oldest and most prestigious universities. It is one of the most prolific producers of research output, occupying an elite position in the differentiated system.

History

South Africa has one of the longest continuous histories of tertiary education on Africa, with the universities of Cape Town and Stellenbosch having been granted full university status in 1918 after decades of prior higher education provision. However, due to the racial discrimination and systemic underdevelopment of certain areas stemming from colonialism and apartheid, the tertiary education landscape that developed was quite diverse in terms of institutional character, quality and mission. That diversity remains the case today. According to Bailey, Cloete and Pillay (2012: 21), "there are three categories of universities in the country presently: 11 universities (those institutions that were defined as such during the apartheid period and remain so); six universities of technology (the former technikons or technical universities); and, six comprehensive universities (which are merged universities and technikons)."

However, the country's challenges have impacted South African universities differently, in many ways reinforcing inequalities that were established during apartheid. That may be slowly changing with the expanded roles of the former technikons, though.

> *The distribution of research capacity in higher education institutions is skewed in favour of historically white institutions. Under apartheid, the development of research capacity in black universities was severely limited, and they have only recently integrated research into their core functions. A research mandate has only recently been included in the institutional missions of universities of technology.* (NPC 2012: 326)

In this way, South Africa's higher education system is both an aberration from and a close replica of the higher education landscape in other parts of the continent, combining both strong and weak educational structures.

UCT's history goes back to 1829, when it was a high school for boys called the South African College. Historically a largely white institution, during apartheid it was considered a site of intellectual resistance by the state – colloquially known as "Moscow on the Hill."[35] Since 1994, UCT has sought to maintain its commitment to academic freedom and research excellence while expanding its access to students from disadvantaged backgrounds.

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35   UCT, Our History, available at: www.uct.ac.za/about/intro/history/

Demographics

According to the Department of Higher Education and Training's (DHET) Green Paper on Post-School Education (DHET 2012a: 37):

> *The 2011 preliminary student head count for the 23 universities was 899,120, which includes both full-time and part-time enrolments for contact and distance study. (The figure for 1994 was 495,356. This represents an increase of almost 82% since the advent of democracy.) … For 2009, 82% of the total head count enrolment was at undergraduate level, while 5% were masters students and 1% were PhD students.*

While the vast majority of these students are South African citizens, a good percentage also comes from other countries, especially SADC countries (DHET 2012a: 51). In total, "South Africa's current participation rate in higher education, at 16–17% of the relevant age cohort (18–24 years old), is substantially higher than the average for sub-Saharan Africa (around 6%)" (Bailey, Cloete & Pillay 2012: 22).

Of the 900,000 university students in South Africa, UCT hosts nearly 26,000 of them, of which more than 8,000 are postgraduates.

Funding

In 2011, 2.47% of the government's total expenditure went to higher education, amounting to 0.75% of national GDP.[36] The sector is funded through two mechanisms – an amount earmarked for specific expenditure as dictated by the government, and a separate block grant over which the universities themselves have discretion (DHET 2012b). Over the past decade, the percentage of funding provided as block grants has steadily decreased from 88% in 2000 to 74% in 2011. Nevertheless, the majority of government funding is not earmarked for specific expenditure and universities retain control over the majority of their expenditure. Universities also receive funding through student fees and accommodation charges, as well as through private donations (Bailey, Cloete & Pillay 2012). Moreover, HEIs in South Africa "are free to generate 'third-stream' income through, amongst others, research and entrepreneurial activities. Such third-stream income constituted 23% and 27% of total revenue in 2004 and 2007, respectively" (Bailey, Cloete & Pillay 2012: 24).

Of UCT's total operating budget income in 2011, ZAR1 billion came from state appropriations (subsidies and grants), ZAR735 million came from student tuition and fees, ZAR117 million came from the sale of goods and services and ZAR23 million came from private gifts and grants.[37]

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36 Financial and Fiscal Commission (2012) *FFC 2013/2014 Technical Report*. Johannesburg: FFC, p. 58. Available at: www.ffc.co.za/index.php/component/docman/doc_download/364-2013-2014-technical-report?Itemid=

37 UCT Facts & Figures (2013), available at: www.uct.ac.za/downloads/uct.ac.za/about/aboutuct_2012-13.pdf

In addition, "total research income was ZAR841 million in 2011,"[38] of which "research contracts to the value of ZAR682 million were processed" (UCT 2012a: 17). "ZAR90.26 million [worth of research contracts] were entered into with South African government departments, public enterprises and statutory bodies in 2012. South African science councils, national research centres and non-profit entities accounted for ZAR48.5 million of signed contracts, whereas contracts with South African industry were valued at ZAR111.4 million. Major South African industry partners include the Eskom Group, Anglo Group, Old Mutual, Rustenburg Platinum Mines, and the Sasol Group" (UCT 2012a: 27). The diversity and scale of this funding allows the university to support substantial levels of research activity.

Human capital

While South Africa's higher education system fares well compared to many other Southern African countries, it is struggling to keep up with its own needs. According to the NPC (2012: 316), "the South African post-school system is not well designed to meet the skills development needs of either the youth or the economy. Approximately three times as many students enter universities each year compared to those entering [Further Education and Training (FET)] colleges. In 2010, universities enrolled around 950,000 students while [FET] colleges enrolled about 300,000." This imbalance at the student level is now being matched at the academic level, as the aging staff cohort fails to be replaced by enough younger academics to cope with the rising student numbers (DHET 2012a: 45).

Thus, "despite the obvious progress with regards to the numbers of doctoral graduates, with 26 doctorates per million of the country's total population, South Africa lags far behind countries such as Portugal (569 PhDs per million), the United Kingdom (288 per million), Australia (264 per million), the United States of America (201 per million), Korea (187 per million) and Brazil (48 per million)" (DHET 2012a: 42). Currently, 34% of higher education sector staff in South Africa have PhDs (NPC 2012: 319).

UCT employs about 5,000 staff members, of which there are "897 permanent instruction/research or academic staff" and an unlisted number of other non-permanent (contract, part-time, visiting) staff, which total close to 1,300, making up an academic staff complement of about 2,200. "The proportion of full-time academic staff qualified at the doctoral level in 2011 was 67%. A further 27% of all academic staff held masters level qualifications" (UCT 2012c: 62).

The university has a student-to-academic staff ratio of approximately 12:1. In contrast to many other universities in the region, UCT has a very strong postgraduate sector. Nearly one third of the student enrolment at UCT is in postgraduate degrees. This has important consequences for UCT's research output – with such a high proportion of its student body involved in research, UCT has a strong endogenous research base.

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38 Ibid.

Infrastructure

South Africa has the best-equipped and most modern ICT system in Africa, with more than one mobile phone per person and high bandwidth capacity. There are large discrepancies in the distribution of these communication resources, with the urban areas being comparatively well resourced, while rural areas in poorer parts of the country have less access. There are 4.127 million fixed telephone lines in operation (less than 10 per 100 population) and 64 million mobile phones in the country of 51 million people.[39]

UCT possesses significant research infrastructure such as scientific laboratories, libraries, computer labs, internet platforms and various types of equipment. Moreover, the institution is home to 71 research groupings, discipline-specific and transdisciplinary research groups "which incorporate members and students from across departments and faculties" (UCT 2012a: 44).

Research

South Africa is the dominant producer of research in Africa, contributing more than 80% of the SADC region's (ISI/WoS-rated) research. The Academy of Science for South Africa (ASSAF) sums up the country's contemporary situation regarding "high-impact" academic research publications (ASSAF 2006: xiii):

> *About 7,000 research articles are published annually from South African addresses in ISI-indexed journals or in un-indexed journals accredited by the Department of Education. Recent surveys of the South African Science and Technology (S&T) indicators … [show that] … 16,000 researchers publish about 7,000 papers a year, or on average about 0.4 papers per researcher per year.*

This research occurs in a diverse national research infrastructure characterised by a differentiated strategy at the education and research levels. "There are multiple sites of research and knowledge production, which are partly or wholly separated from higher education: in industrial laboratories, government departments, corporate research units, parastatals, statutory research councils and NGOs, or through collaboration between these organisations" (NPC 2012: 326).

UCT scholars are actively engaged in research, in terms of conducting it, getting money and contracts to do it and in producing outputs as a result of it (UCT 2012a: 13):

- 1,218 research contracts
- ZAR682 million value of research contracts
- 415 NRF-rated researchers
- 33 SARChI research chairs
- 1,314.40 units publication count
- 2,500 journals, books and proceedings

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39 IndexMundi, South Africa Telecommunications Profile 2013, available at: www.indexmundi.com/south_africa/telecommunications_profile.html [accessed 3 December 2013]

Management

The DHET is responsible for managing the higher education sector in South Africa. It not only oversees the 23 public universities and 50 Further Education and Training (FET) colleges and various Skills Education and Training Authorities (SETAs), but also looks after other key parts of the national research infrastructure, including the Human Sciences Research Council (HSRC), National Research Foundation (NRF), the Council for Scientific and Industrial Research (CSIR), the Medical Research Council (MRC) and so forth. These bodies promote research production in their fields and also provide funding to researchers and research entities.

At UCT itself, scholars enjoy the support of a broad array of entities such as the UCT Research Office,[40] the Research Contracts and Intellectual Property Services Office,[41] the Office for Industry Liaison and the Intellectual Property group.[42] These entities leverage the skills of scholars to obtain more research funding and opportunities, or they leverage the value of their research results so that they can have the broadest impact. UCT's Integrated Research Management Application (IRMA) also helps collect research data for the Annual Research Report and Publication Count processes,[43] granting the management detailed information for self-assessment, one of the key elements setting it apart from many other universities in the region.

UCT's institutional culture is best described as "collegial", in that much of the operational power of the university exists at the faculty level. It is also characterised by high levels of personal autonomy for scholars, who are able to have a say in how the university works. This has allowed the upper echelons of the university to focus on high-level strategy rather than everyday bureaucratic maintenance.

University of Mauritius

As a tiny island in the middle of the Indian Ocean, Mauritius boasts a unique geography, demography and history. Originally a low-income, agriculture-based (sugar) economy, it has since transformed itself into a light industrial (textile) and services-based (tourism) economy and now seeks to evolve yet again into an important player in the "knowledge economy".

Set in the central part of the island in Reduit, UoM is the largest provider of tertiary education in the country, with almost a quarter of all national tertiary enrolments. It is now just one of many HEIs to choose from, but its relatively long history, consistent government support, flagship status and solid level of international connectivity through administrative and faculty networks make it an important education institution for scholars throughout the region.

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40   Research Office, available at: www.researchoffice.uct.ac.za
41   RCIPS, available at: www.rcips.uct.ac.za/contracts/overview/
42   IP Group, available at: www.rcips.uct.ac.za/ip/overview/
43   IRMA, available at: www.researchoffice.uct.ac.za/publication_count/irma/

History

Before Mauritius gained its independence in 1968, it was characterised by high levels of underdevelopment, reliance on primary industry (largely sugar cane farming), an oligarchic social structure with European-descended citizens owning most of the island's capital and a heterogeneous working population of African, Malagasy, Chinese and Indian descent. At independence, the island had the highest population density in Africa, a rapidly growing youth population and ethnic tensions that made it a "strong candidate for failure" (Subramanian & Roy 2003: 1). However, it was able to sustain high rates of GDP growth of 5.9% per year, compared to an average 2.4% across the rest of Africa (Subraiman & Roy 2003: 3), diversify its economy, and maintain inclusive democratic participation and governance.

In 1968, the only tertiary institution that existed on the island was UoM. Since then, the tertiary education sector has grown significantly and now includes 74 public and private HEIs (TEC 2007: 1). UoM was originally focused on teaching, but it has gradually tried to develop itself into a "research-informed" university. That is, scholars were given mild encouragement to conduct and publish their own research, especially in the sciences. Significant funding from the World Bank made research facilities available early on, leading to notable improvements in research capacity. Coupled with the rising numbers of staff PhD holders, the university has expanded its research mission and offered more post-graduate programmes for UoM students.

Demographics

With a population of approximately 1.3 million and a per capita GDP of USD14,594, education is seen as crucial to long-term government planning in Mauritius, especially the goal of having "a graduate in every household" (MTESRT 2013). The gross tertiary enrolment ratio is 45%, with 14% of the 45,969 students currently enrolled in post-graduate programmes (TEC 2013). However, more than a third (33.6%) of Mauritian students are enrolled in international universities (Mahlaha 2012: 51). With the government's desire to transform Mauritius into a knowledge economy by 2025 (TEC 2013), the higher education system plays a central role in helping achieve this goal.

UoM has 11,395 students, of which 26% are enrolled for part-time studies and 10% are enrolled for postgraduate degrees. More than half of the students are female. To teach and supervise these students, the university employs about 260 full-time academics.

Funding

The government spends 13.3% of its budget on education, amounting to 3.65% of national GDP. Undergraduate students do not pay student fees, but postgraduate and diploma students pay full price. The majority of funds for research and publication in Mauritius is distributed by the Mauritius Research Council (MRC) and the Tertiary Education Commission (TEC), under the aegis of the Ministry of Tertiary Education, Science, Research and Technology (MTESRT).

The MRC promotes and coordinates the government's investment in research. It provides funding through research grant schemes that prioritise issues of national interest, namely biomedical and pharmaceutical research, ICTs, land and marine use, energy and waste management, and science, technology and education. It also supports research commercialisation and industrial–academic relationship building.

The TEC is responsible for allocating funds to each of the various Mauritian HEIs, including UoM. It also provides research funding to experienced scholars (those with 30+ years of experience) through a programme of research funding for short-term (under two years) projects (TEC 2013: 25).

According to the *UoM Annual Report* (UoM 2012), the university's research expenditure in 2011/2012 amounted to MUR 35.5 million (USD1.2 million) out of an institution-wide expenditure total of MUR734 million (USD25.3 million). This equals about 5% of the university's total expenditure. As part of this, "in order to encourage further research, each Faculty was allocated one million rupees so as to carry out viable research projects emanating from the UoM Research Week 2011" (UoM 2012: 3). The vast majority of the university's expenses go to staff salaries, comprising 76% of total expenditure (UoM 2012: 103).

Human capital

Mauritius has set an impressive standard for the region with its proportion of PhDs. In SADC, "only South Africa and Mauritius have a PhD qualification rate of above 0.3 PhDs/FTE/year" (Kotecha, Walwyn & Pinto 2011: 29). At the staffing level, the higher education sector "employs a total of some 2,700 persons on a full-time basis, of which around 400 work in private institutions. Overall, 30% of the employees are academic, 35% administrative, 15% technical/paraprofessional and 15% services/maintenance cadres. The number of employees working in the publicly funded institutions hover around 2,300."[44]

As of 2009/2010, 45% of UoM's roughly 260 academic staff held doctoral degrees and 44% held masters degrees (CHET 2012: 11). While 50% is considered a desirable benchmark by many analysts, the university's growing proportion of PhD holders has encouraged it to start more of its own PhD programmes on campus. Thus, in terms of graduate degrees produced, UoM greatly increased its outputs in 2010/2011, with a 25% increase in masters degrees awarded and a 42% increase in PhDs (UoM 2012).

Infrastructure

Mauritius has a relatively high penetration of both mobile and fixed-line telephony compared to other SADC countries, with approximately 30 fixed lines per 100 population and 100 mobiles per 100 population (SADC 2012). Its internet penetration rate is 35%, just above the global average of 34.7% and more than twice the African average of 15.6% (Internet World Stats 2012).

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44   TEC, Review of the tertiary education sector 2011/2012, available at: http://tec.intnet.mu/tesm_rvw.php

Mauritius compares favourably with SADC peers in terms of internet connectivity and upload and download speeds. However, as an island nation, it remains dependent on a single cable for its international connectivity in the form of the South Africa Far East (SAFE/SAT-3) cable. This means limited international network redundancy.

However, regarding UoM, a TEC audit report (TEC 2012: 62) stated that "it is evident that the University's teaching and learning infrastructure is ageing or even lacking, particularly for laboratory-based studies. The Audit Panel heard examples of equipment that is old or outdated, an insufficient number of instruments such as microscopes, a lack of chemicals, [etc.]." Facing such challenges and a corresponding lack of funds to rectify this quickly, many science scholars outsource elements of their data collection processes to overseas universities that have the equipment and capacity to do so. This is standard practice in the sciences, but it is not ideal for the development of in-house scientific research capacity.

At UoM, communication activities are supported by the Virtual Centre for Innovative Learning Technologies (VCILT) and the Centre of Information Technology and Systems (CITS), with the latter providing internet connectivity to the campus as well as most of the ICT systems support. CITS is often used by academic staff for a variety of research purposes, from purchasing specific software, to establishing video-conferencing and internet connectivity at seminars/workshops. CITS also provides the university with a wide range of ICT systems to support communication activities, including Google emails for staff and students, the university website, an online staff profile system and online applications for admissions, staff recruitment and module registration.

Research

While UoM is the primary research body in the country, a number of other institutes and centres also focus on researching specific areas of national importance, such as fishing and agriculture,[45] which enhances the diversity of the island's research environment, creating opportunities for researchers who want to apply their talents locally. Most of this activity is overseen or coordinated by the MRC, which also provides funding through competitive grants. For instance, "during the financial year 2008/2009, MRC had processed thirty six research applications. Thirty new projects were approved bringing the research portfolio to 349 with project value of MUR133 million. The total number of projects has increased from 52 to 349 implying an average of 32 projects per year. The project value has risen from MUR20.6m to MUR133m entailing that the council spent nearly MUR12m on average each year" (MRC 2009: 29).

Of these projects, about a quarter of the funding went to UoM-related research: "Academia, which includes the University of Mauritius and the University of Technology, are the major collaborating partner with a contribution of 27% in research work as at 30 June 2009" (MRC 2009: 31).

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45 Mauritius Science Portal (2013), Research Institutions in Mauritius, available at: www.gov.mu/portal/sites/nsp/research/institution.htm

Beyond these indicators, it is difficult to ascertain exactly the level of research production at the national level, but according to Wilson-Strydom and Fongwa (2012: 44), the island's two public universities combined to produce 188 peer-reviewed journal articles, one peer-reviewed book, seven book chapters, zero patents and 45 other items in 2010. The vast majority of these came from UoM faculty members.

According to Bunting and Cloete (2012: 30), UoM scholars produced 36 peer-reviewed research outputs in 2007, then just 26 in 2008. That would be 1 in 10 UoM scholars producing peer-reviewed research outputs in that year. Taking the analysis further, "the average ratio is 0.12 [peer-reviewed publications per year per scholar], which implies that Mauritius' permanent academic staff would produce on average one research publication every eight years" (CHET 2012: 12).

As we have argued in the opening chapter, these numbers grossly underestimate the amount of research production that goes on in African institutions, because they focus solely on measuring outputs in "prestigious" journals rather than the many that are not listed in the Thomson Reuters Journal Citations Report. In our data (which we discuss in Chapter 5), we found that UoM FoS scholars produced far more than one research output every eight years, but they were not necessarily published into WoS-rated journals. For a more accurate picture of research production, the *UoM Annual Report* (UoM 2012) provides better evidence of the quantity and diversity of outputs.[46]

One of the journals not on the WoS lists is the *University of Mauritius Research Journal*, a crucial publication outlet for some UoM scholars. During the 2011/2012 academic year, "76 requests for publication in the *UoM Research Journal* were received. Among these, 49 pertained to papers presented at the UoM Research Week 2010/2011. From 1 August 2011 to 31 July 2012, 27 articles were accepted for publication in the UoM Research Journal among which 14 emanated from the UoM Research Week" (UoM 2012: 15).

Management

As already discussed above, the three primary bodies managing higher education in Mauritius are the MTESRT, TEC and MRC which combine to regulate, accredit and fund the various HEIs. They also provide strategic guidance on research, prioritising projects that fit within national research priorities. Their role in directing UoM research strategies cannot be overstated.

UoM itself is considered a highly "bureaucratic" institution (TEC 2012; Manraj 2013). This is exemplified by the abundance of administrative and support staff: of the 879 permanent staff employed in 2009/2010, only 225 were academic staff (Cloete & Bunting 2012). This abundance, however, did not translate into smooth administrative processes, such as the purchasing of new equipment:

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46   See especially pp. 76–82 of the *UoM Annual Report 2011–2012*, which lists the Faculty of Science publications for the year, available at: www.uom.ac.mu/aboutus/AnnualReport/2011_2012/07FOS.pdf

Despite departments and faculties submitting proposals for replacement of equipment, and despite the applications being approved for funding, the bureaucratic procedures and delays that characterise the procurement process are both frustrating and demotivating. There appears to be no clear University-level process to determine priorities for procurement of new equipment. It was explained that the Public Procurement Act 2006 has brought in more detailed public procurement processes. Consequently, the purchase of items requiring approval of the Public Procurement Office is quite lengthy. However, even items that do not need this approval can take time to purchase. (TEC 2012: 63)

Complicating the situation considerably is the reported lack of administrative staff during institutional audits: "The Audit Panel heard repeated comments of a shortage of administrative staff, although the aggregate ratios of academic to administrative staff suggest a very high number of administrative staff" (TEC 2012: 46).

As a result, there seems to be both an overabundance of administrative staff, yet a shortage of administrative capacity. "Excessive centralisation" (Manraj 2013: 10), in which the upper administration decides on issues that could be better handled by individual faculties, has been proposed as one of the core problems facing UoM.

Compounding this, the vice chancellor's office has seen a high turnover rate over the past few years, with the latest VC summarily dismissed in mid-2013. He lasted in the post only about a year. These disruptions in the top office have led to certain research strategies remaining unimplemented as the university waits for stable, strategic leadership.[47]

While this may describe the general situation at the university, it has tried to rationalise and streamline its approach to research management. The management and diffusion of research is governed by the Office of the Pro-Vice-Chancellor for Research, Consultancy and Innovation (Pro-VC RCI), which oversees a number of operational committees that deal with the implementation of research policies and procedures, coordinating research and providing facilities and funding for university research. It also runs the Consultancy and Contract Research Centre (CCRC) and the Centre for Applied Social Research (CASR). The CCRC aims to encourage academic staff to undertake consultancy and to establish closer links with industry while the CASR aims to design, carry out and interpret research studies within the field of public policy.

University of Namibia

Namibia has a unique history that differentiates it from its continental and regional neighbours. Historically, while Namibia was colonised at the same time as most of the rest of Africa in the 1880s, it was the only area in the region taken over by the Germans who ruled the country with memorable brutality.[48] But after three decades of colonial

47   Guillaume Gouges (17 Aug 2013) Controversy as university fires vice-chancellor, *University World News*, available at: www.universityworldnews.com/article.php?story=20130816180045660

48   Andrew Meldrum (16 August 2004) German minister says sorry for genocide in Namibia, *The Guardian,* available at: www.theguardian.com/world/2004/aug/16/germany.andrewmeldrum

rule, Germany was defeated in World War I and forced to hand over control of "South West Africa" to South Africa (under a League of Nations mandate). South Africa then "administered" it as an unofficial fifth province until 1990 when Namibia gained its independence. During its rule, the South African government extended apartheid laws over the area and used the northern reaches of the country as a staging ground for military operations against Communist fighters in Angola. This militarisation of the region had a galvanising effect, however, on the South West Africa People's Organisation (SWAPO), the country's liberation movement that took over political leadership of the newly liberated Namibia as apartheid was nearing its end in South Africa. SWAPO still governs the country today, and many of its top leadership were instrumental in shaping the current features of the country's higher education landscape, including the establishment of UNAM.

UNAM and the Polytechnic are the two universities that serve the country, though they are gradually being supported by the growth and development of the higher education sector. Established soon after independence, UNAM has steadily grown to the point that it now comprises ten campuses (the primary one being located in the capital, Windhoek) with both a contact and distance learning element. The university is responsible for most research activity in the country.

History

Namibia has a relatively short history of internal higher education provision. Until the establishment of the Academy of Tertiary Education in 1980, tertiary education was undertaken overseas, or in South Africa proper. Currently, there are two public and two private higher education institutions in the country, the largest of which is UNAM, which is responsible for 53% of higher education sector enrolments (SARUA 2012: 1). Established in 1992, UNAM has grown rapidly and now educates 13,000 students, with a growing postgraduate component. In 2010 it merged with four teacher training colleges, resulting in a considerable influx of teaching staff with minimal research experience. The Polytechnic of Namibia is the second major provider of educational services, with nearly 9,000 students.

UNAM was established in 1992 as "a centre of higher learning served by dedicated men and women of quality, and producing graduates to uplift the standards of living of Namibian people." Guided by the motto "Education, Service, Development", the University's programmes are "designed to meet national human resource requirements through quality teaching, research, consultancy and community service."[49]

The university maintains close relationships with the national government. This is reflected in the UNAM mission statement, which is strongly aligned with national developmental goals and highlights the importance of remaining relevant to Namibian society. Government consults regularly with senior management officials, who often play roles in government themselves, and there is generally a strong relationship between them (Kirby-Harris 2003).

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49   UNAM History, available at: www.unam.na/about_unam/history.html

Demographics

Bordered by Angola to the north, Botswana to the east and South Africa to the south, Namibia is a large, mostly arid country with a population of approximately 2.3 million (Mahlaha 2012). Achieving independence in 1990, the country has since remained politically stable, but it suffers from relatively high unemployment at a rate of 27.4%,[50] high rates of HIV infection, and highly unequal distribution of wealth. In this way, Namibia is quite similar to its neighbours, sharing a similar unemployment, health risk, inequality and mineral reliance profile.

Nevertheless, Namibians have largely been able to see to their own higher education needs, with the vast majority of educators in the sector hailing from the country. According to Mahlaha (2012: 66), "the Namibian public universities reported having 858 academic and research staff, the majority of whom (93.4%) are national citizens. Only 120 (6.6%) of the academic and research staff were reported to be from outside Namibia (75 from other SADC countries, and 45 from countries outside the SADC region)."

With a student population of close to 13,000, academic programmes at UNAM emanate from eight faculties and two schools. To date, UNAM has graduated over 17,000 students who are serving the country in various sectors of the economy, with a number occupying prominent positions in government and the private sector.

Funding

Of the national budget, 22% went to education in 2010, of which 17% of that went to higher education provision (SARUA 2012: 4). While the proportion of spending on education has been holding firm in the low twenties for some years, the tertiary funding portion of that funding has jumped from an average of 10% up until 2009 to 17% in 2010, signalling a growing importance for the government in tertiary education, though the percentage of GDP that this represents is still only 0.6%.[51]

The university allocates a budget of approximately N$ 1 million (USD101,010) every year to the Research and Publications Office (RPO),[52] which distributes it in grants to scholars and UNAM's various research centres. According to the RPO website:

> *The RPO administers a Budget which caters for Research Projects, Conference attendance and Publication charges …. Proposals are expected to address the research issues prioritised by the applicant's Faculty/Centre in its Research Strategy. It is also expected that senior academics should include young researchers in the research teams for mentoring and capacity-building purposes. Collaborative research is encouraged, hence priority for funding will be given to proposals that fulfil this requirement.[53]*

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50   Namibia Statistics Agency (2013) *The Namibia Labour Force Survey 2012* Report, available at:

51   Moses Magadza (30 November 2013) Namibia: Wake-up call for the higher education sector, *University World News*, available at: www.universityworldnews.com/article.php?story=20131128172631434

52   UNAM Research, available at: www.unam.na/research/preface.html

53   RPO research guidelines, available at: www.unam.na/research/guidelines.html

The research budget that the RPO deals with amounts to approximately 1% of the university's entire budget (SARUA 2012: 4). The sources of funding for UNAM research (in 2011) are as follows (SARUA 2012: 5):

- Government subsidy/grants: 64%
- Donations – private individuals/trusts: 21%
- Donations – private sector/businesses/corporation: 5%
- Donations – international funders/donors: 2%
- Loans: 5%

Human capital

Namibia's tertiary education sector currently has a gross enrolment ratio of 10.5%,[54] which is greater than the African average of about 6%, but lower than that of Botswana (16.4%), South Africa (18%) and Mauritius (45%).

In 2011, 21,455 undergraduate students were enrolled in Namibia's two public universities (UNAM and the Polytechnic) as well as 429 masters students, 78 doctoral students and 10 post-doctoral students (SARUA 2012: 2). In that same year, nationally there were 3,526 Bachelors degrees awarded, 20 masters, four PhDs and 14 post-docs (SARUA 2012: 3).

Of the 718 permanent academic staff members at UNAM, 122 hold PhDs, 36 are full professors and 288 of the lecturers hold masters degrees.[55]

Infrastructure

Namibia has an internet penetration rate of 12%,[56] mobile telephony coverage of just over 100 mobiles per 100 population, but a low number of fixed lines, less than 10 per 100 population.[57] Internet access is strongly located in the urban areas.

A wireless network was established at the university's main campus in February 2012;[58] however, connectivity problems, especially with regard to accessing e-journals, have been noted as a problem in institutional self-evaluation reports (CEQUAM 2012). As will be discussed in Chapter 6, UNAM also has a new institutional repository where the university's scholarly outputs are curated and profiled.[59]

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54 Ibid.
55 About UNAM, available at: www.unam.na/about_unam/about_unam_index.html
56 Internet World Stats, Internet Usage Statistics for Africa, available at: www.internetworldstats.com/stats1.htm [accessed 4 December 2013]
57 IST Africa, Overview of ICT infrastructure in Namibia, available at: www.ist-africa.org/home/default. asp?page=doc-by-id&do-cid=3581 [accessed 4 December 2013]
58 eLearning Africa (6 March 2012) The University of Namibia goes wireless, available at: www.elearning-africa.com/eLA_Newsportal/the-university-of-namibia-goes-wireless/
59 UNAM Digital Collections, available at: http://digital.unam.na/

Research

As a small country with a small academic cohort, Namibia produces a modest amount of research per scholar/researcher. According to SARUA, in 2010, Namibia produced 98 peer-reviewed journal articles, 10 peer-reviewed books, 29 peer-reviewed book chapters, seven patents and 228 reports, theses, study guides and conference papers (SARUA 2012: 8). However, this represents solid growth from the average rates of production in previous years. As Nkwelo (2012: 140) notes:

> *According to the Institute for Scientific Research, Namibia produced a total of 480 [ISI-rated] papers between the years 2001 and 2007. This implies an average of 64 papers per year. There is a clear increase in output over the past three years which is worth mentioning. Although the University of Namibia is mainly a teaching university with low staff numbers it still produces the bulk of these papers. Other research institutions which regularly publish a significant number of papers are the Ministry of Fisheries and Marine Resources (which collaborates with UCT in Cape Town), the Desert Research Foundation, Geological Survey, which produced 23 and 21 publications respectively, significantly lagging behind UNAM.*

With regards to the level of international collaboration involved in various research publications between 1994–2004, scholarly collaboration leading to publication in ISI-rated journals was primarily with South Africa (75 papers) and Germany (71), followed by the USA (38), England (27) and France (18). Collaborations with other non-South African regional or continental partners were less robust, with Kenya leading with four papers (Nkwelo 2012: 142).

UNAM has only recently begun to engage strategically with research communication, but it is making significant efforts to ramp up research production and to create a stronger research culture amongst staff and postgraduate students. The UNAM Research Strategy was written in 2005, identifying various rewards and incentives for achieving this goal (Kiangi 2005).

In the latest publicly available Research Report, UNAM's management states that the university "has continued to take the lead in research performance in the country … The year under review has seen a total output of 394 publications from the University, 23% of which are peer-reviewed journal articles and 11% are books and book chapters" (UNAM 2009: 6). Crucially, 66% are "other" outputs, the kind of outputs that remain invisible to the ISI/WoS indexes upon which institutional reputations are built.

The Faculty of Humanities and Social Sciences (FHSS) – SCAP's research and pilot site – produced 25% of all university outputs during the noted year (the largest proportion for all of the faculties) (UNAM 2009: 9). However, when it comes to the production of peer-reviewed journal articles, only 13% were published by the FHSS, while the Faculty of Science produced 30% (UNAM 2009: 10). This suggests that science communication is more skewed towards peer-reviewed journal production than the humanities and social sciences, which produces outputs in a more varied set of genres.

In its latest five-year Strategic Plan, the university has set ambitious targets for raising the rate of research production from its current modest base. Aiding in this effort is the recent capacitation of the UNAM Press. First established as an imprint in 2002, the Press became a fully functioning publishing unit in 2011. It plays an important role in assuring that more UNAM research is disseminated beyond the university, adding another publishing channel for scholars to consider.

Management

With the recent implementation of the Research, Science and Technology Act in 2011 (as discussed in Chapter 4), Namibia has started to take some steps in increasing its research capacity. While it is still setting up a national research fund, there is already a Directorate of Research, Science and Technology and a newly established National Commission on Research, Science and Technology (NCRST), which was constituted to oversee the promotion and funding of research nationally. Once NCRST starts to administer funding – allowing university and other researchers to apply for funding outside of university research budget constraints – Namibia will be in a better place to answer many of the government's desires for research that helps prepare Namibia to participate in the global knowledge economy.

Along with UNAM's central administration – whose culture we characterise as "developmental" in later chapters – scholars are supported by a number of structures that help with producing and disseminating research. The primary entity is the RPO, which regulates, promotes and encourages research and publication among the academic community within the university, offering workshops,[60] institutional reviews, policy support, research proposal development, intellectual property guidance and quality assurance assistance.[61]

These general support services are enhanced by the presence of the University Central Consultancy Bureau (UCCB), which tenders "on behalf of the University for contracted projects and for which UNAM has expertise,"[62] and the Multi-disciplinary Research Centre (MRC), which conducts research in the physical and social sciences.[63]

Conclusion

This brief discussion of the factors shaping Southern African and our partner institutions' research and communication contexts gives an indication of how diverse the higher education sector is in this region. While SADC universities share certain historical and developmental features, creating the impression of a stable regional profile, they are in fact also shaped by quite particular experiences, challenges and aspirations that require anyone who would seek to intervene in these institutions to pay attention to their granular details along with their broader regional similarities.

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60 RPO research training, available at: http://www.unam.na/research/training.html
61 UNAM Research, publications, papers, journals, abstracts: Preface, available at: www.unam.na/research/preface.html
62 UCCB, available at: www.unam.na/centres/uccb/uccb_index.html
63 UNAM Research, available at: www.unam.na/research/preface.html

UB is the flagship university of a large country in size, but small country in population, a fact it shares with UNAM. But unlike its Namibian neighbour, it is much older and features mature research support systems. It has embarked on a more robust research mission over the past years, developing policies, technologies and funding opportunities to match that ambition. By regional standards, it is a strong, stable institution.

UCT is an outlier in this group due to its age, history, demography and wealth. Along with a few other South African universities, its relatively impressive research output numbers help boost the broader regional research profile. But despite its age and traditions, UCT is trying to transition into a more locally responsive university that is accessible to South Africans of all backgrounds in the post-aparthed era. This is a sensitive challenge, one that the university is attempting to balance against its desire to also be a "world class university".

UoM is the higher education powerhouse in Mauritius with a strong teaching history and moderate research capacity. As a small university on a geographically remote island, it enjoys close relations with the government (as "everyone knows each other here") which has established a diverse research infrastructure to both support UoM research and diversify the points of national research production.

Lastly UNAM is a new university with a strong teaching focus and a growing research commitment. Similar to most African universities after independence, it has a pronounced developmental focus which has, for the most part, resulted in graduates who can contribute their skills to the country, but increasingly in research outputs that can contribute knowledge ton anyone about the country. As the primary research provider in Namibia, UNAM bears a heavy burden, but the government is gradually expanding the research infrastructure and funding opportunities that will enhance research production at UNAM and beyond.

With these contextual details in mind, we now assess the policies shaping Southern African research and communication activities.

Chapter 4
Scholarly communication policy landscape in Southern Africa

In this chapter, we examine the policy landscape shaping Southern African research and communication activities, especially as they pertain to our four partner universities. We do so by viewing this landscape from three vantage points: the international context, the national context and the institutional context. Through this nested approach, we will get a clearer idea of how the universities' scholarly communication activities respond to their surrounding policy environments. Through a thick description of these landscapes, we will be able to set the stage for our later analysis of the scholars' actual research and dissemination practices as they occur within these "rules" structures.

The international context

The scholarly communication policy environment in Southern Africa remains highly influenced by academic norms established in the global North. This is not only due to the historical foundations of the universities themselves – derived from British models in the cases we studied – but the nearly hegemonic position that European and North American universities enjoy in setting global academic standards. This helps to explain why, even though Northern and Southern universities are often animated by different values and missions, their scholarly communication methods are largely the same, even if those divergent missions might be better served by different communication strategies.

The scholarly communication norm up until recently has been characterised by three prevailing features. In this "traditional" model, scholarly communication is:

1.   disseminated primarily through journal articles, books and book chapters, thus equating to scholar-to-scholar communication
2.   published by third-party commercial publishers that charge subscription fees (for institutions) or purchase costs (for individuals) to access their publications
3.   often assessed according to a work's Impact Factor, the metric purporting to measure a work's prestige and "importance" based on the average citation rate the publishing journal's articles collectively achieved during a two-year period.

However, these normative standards are in a massive state of flux as the open access (OA) and alternative metrics movements challenge the utility of the traditional scholarly communication model and the arithmetic sensibility of the Impact Factor. These challenges emanate largely from within the institutions of the global North, but they also shape Southern scholarly communication opportunities, offering new possibilities for greater visibility and social "impact".

Open access goes mainstream

Over the last five years, global scholarly communication discourse has changed dramatically, moving from a discretionary consideration in academic research activity to an integral component of that process. In many ways, this is due to the achievements of the open access movement, which gained the scholarly, institutional and governmental support necessary to move from the activist fringe to the mainstream. This transition was signalled by the raft of policies adopted by major research-funding bodies which required that all research funded by them was made OA, such as the:

- European Commission (EC)[64]
- European Organisation for Nuclear Research (CERN)[65]
- European Research Council (ERC)[66]
- Max Planck Society[67]
- Research Council UK (RCUK)[68]
- UK government[69]
- UK Department of Health (NHS/NIHR)[70]
- UNESCO[71]
- US government agencies[72]
- US National Institutes of Health (NIH)[73]
- World Bank[74]

64 European Commission MEMO/12/565 (17/07/2012), Open access to scientific data – Communication and Recommendation – background, available at: http://europa.eu/rapid/press-release_MEMO-12–565_en.htm?locale=en

65 CERN Scientific Information Service, Supporting Open Access Publishing, available at: https://oldlibrary.web.cern.ch/oldlibrary/OpenAccess/PublicationPolicy.html

66 Open Access Guidelines for researchers funded by the ERC, available at: http://erc.europa.eu/sites/default/files/document/file/open_access_policy_researchers_funded_ERC.pdf

67 Open Access and the Max Planck Society: http://edoc.mpg.de/doc/help/mpg_oa.epl

68 RCUK Policy on Open Access, available at: www.rcuk.ac.uk/research/outputs/

69 Finch J (2012) *Accessibility, Sustainability, Excellence: How to Expand Access to Research Publications*. Report of the Working Group to on Expanding Access to Published Research Findings: The Finch Group. Available at: www.researchinfonet.org/wp-content/uploads/2012/06/Finch-Group-report-FINAL-VERSION.pdf

70 Statement on DH/NIHR-funded research and UK PubMed Central: www.nihr.ac.uk/files/pdfs/OpenAccessPolicyStatement.pdf

71 Swan A (2012) *Policy Guidelines for the Development and Promotion of Open Access*. Paris: UNESCO. Available at: http://unesdoc.unesco.org/images/0021/002158/215863e.pdf

72 John Holdren (22 February 2013) Memorandum for the Heads of Executive Offices and Agencies, available at: www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

73 NIH Public Health Policy Details: http://publicaccess.nih.gov/policy.htm

74 World Bank Open Access Policy for Formal Publications, available at: http://documents.worldbank.org/curated/en/2012/04/16200740/world-bank-open-access-policy-formal-publications

With these major funders[75] requiring that their research outputs be made freely available to the public, scholars and universities have had to think beyond the traditional scholarly communication paradigm, a reality with which our partner universities in Southern Africa were just beginning to grapple.

Another key implication of these mandates is that while some funders such as the European Commission focus their OA requirements on traditional scholarly outputs (such as peer-reviewed journal articles), others such as the World Bank require it for all types of research outputs (including reports, working papers, policy briefs, data, etc.), thereby broadening the very notion of what constitutes scholarly communication. SCAP argued for this enlarged approach to scholarly communication throughout its engagement with Southern African universities, but it will likely only become a mainstream proposition through the continued production and dissemination of such alternative outputs by the scholarly community in response to incentives such as funder mandates and institutional reward systems.

Along with these funders, many universities have also adopted OA policies governing the dissemination of their faculty members' research outputs, including Concordia, Dartmouth, Duke, Edinburgh, ETH Zurich, Harvard, MIT, Princeton, UC Berkeley and the University College London.[76] These universities are contributing to a groundswell of institutionally based action endorsing OA principles.

While funder mandates have given a major financial and policy incentive for scholars to communicate their research openly, the growth of open dissemination platforms – such as OA journals and institutional repositories (IRs) – has also made such a choice more feasible. For instance, according to Laakso and Björk (2012), between 2000 and 2011, the number of OA journals worldwide has grown significantly, as has the number of articles published in an OA fashion. In 2000, 744 OA journals published 20,700 articles. In 2011, 6,713 full OA journals published approximately 340,000 articles. Each year, the proportion of OA articles rises by about 1%, totalling approximately 17% of the 1.66 million articles listed in the Scopus journal article index in 2011. The fact that many smaller OA journals are not even featured in indexes such as Scopus or the Web of Science suggests that the proportion of OA publishing is even higher than often recognised, a fact that confirms the considerable impact that OA outlets are having on scholarly publication (Laakso *et al.* 2011).[77]

This growth has been matched by the expansion of open access IRs where universities curate, profile and disseminate their scholars' research, some of which has been formally published elsewhere. According to the Open Directory of Open Access Repositories (OpenDOAR), the number of IRs worldwide has increased from 128 in December 2005

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75 For a more comprehensive list of funder open access mandates from BioMed Central, see: www.biomedcentral.com/funding/funderpolicies

76 For a list of universities worldwide with Open Access policies from BioMed Central, see: www.biomedcentral.com/funding/institutionalpolicies

77 For an incisive summary of Laakso and Björk's article, see Ben Mudrak (10 November 2012), New Study Tracks Growth of Open Access Publishing, *AJE Expert Edge*, available at: http://expertedge.journalexperts.com/2012/11/10/new-study-tracks-growth-of-open-access-publishing/

to 2,454 in October 2013.[78] This includes 81 repositories currently in Africa (3.3% of the global total)[79] of which 69 are located in sub-Saharan Africa (40 of these are in Southern Africa). The proliferation of repositories worldwide offers new possibilities for universities to take greater control of their scholarly communication destinies.

These two dissemination mechanisms – open access journals and open access IRs – are the subject of an intense debate concerning which platform offers the most viable, sustainable and affordable OA dissemination mechanism going forward. This debate is known as that between the "gold route" and the "green route".

According to the Joint Information Systems Committee (JISC), the gold route involves "publishing in a fully open access journal or website. Subjected to the same peer-review procedures as a traditional journal, the open access journal will usually be available online. Authors may need to pay for their work to be published, although this is rare as it is often provided for by the research grant. Some institutions even pay these article processing charges (APCs) out of a central fund to account for the differences between research councils."[80]

The green route involves "self-archiving in a repository." While this can lead to logistical challenges (such as getting scholars to upload their own materials), "repositories offer a number of benefits. They increase the availability of some published journal works with restrictions on reprinting or text mining, and may enable work to be propagated across the internet and used for novel applications. Repositories also allow authors to keep track of who is downloading their data."[81]

While SCAP believes that there are merits to both approaches, we did not promote one over the other in our engagements with our partner universities. We were more interested in helping to establish an open access ethos where scholars, managers and librarians could identify and pursue OA strategies in line with their own interests and capacities. Because of this, during the course of our research and interactions with these universities, project participants became attuned to the ways in which international OA trends were impacting scholarly communication opportunities.

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78   Growth of the OpenDOAR Database – Worldwide, available at: www.opendoar.org/onechart.php?cID=&c-
       tID=&rtID=&clID=&lID=&potID=&rSoftWareName=&search=&groupby=r.rDateAdded&orderby=&chart-
       type=growth&width=600&height=350&caption=Growth%20of%20the%20OpenDOAR%20Database%20-%20Worldwide

79   OpenDOAR Proportion of Repositories by Continent – Worldwide, available at: www.opendoar.org/onechart.php?cID=&c-
       tID=&rtID=&clID=&lID=&potID=&rSoftWareName=&search=&groupby=c.cCContinent&orderby=Tally%20DESC&chart-
       type=pie&width=600&height=300&caption=Proportion%20of%20Repositories%20by%20Continent%20-%20Worldwide;
       see the distribution of repositories worldwide through this dynamic Google map from Repositories66, available at: http://maps.
       repository66.org/; see also the Registry of Open Access Repositories (ROAR), available at: http://roar.eprints.org/

80   JISC, Gold and green: the routes to open access, available at: www.jisc.ac.uk/whatwedo/topics/opentechnologies/openaccess/
       green-gold.aspx

81   Ibid.

Revised approaches to assessing impact

Another key debate shaping international scholarly communication discourse and the policies that universities use to assess their own academics' research revolves around the value and utility of the Impact Factor, a common performance assessment metric. The Impact Factor is a number representing the average number of citations that a journal's articles collectively receive during a two-year period. Thus if the Impact Factor for a journal in 2012 is 1.5, then the articles published in that journal in 2010 and 2011 collectively averaged one-and-a-half citations in 2012. The point of the Impact Factor – devised by the Institute for Scientific Information (ISI) in the 1960s and now known as the Thomson Reuters Web of Science (WoS)[82] – is to measure the "impact" of a journal within a given academic field and, by proxy, suggest an evaluation of the relative impact of the articles published within it.

For university managers, the Impact Factor offers a handy "objective" means for estimating the quality and "impact" of a scholar's publication. For instance, during a scholarly assessment exercise (such as for promotion), managers can utilise the Impact Factor to help them gauge the level of contribution that a scholar is making to his or her field. Because there are tens of thousands of journals published globally, and because it is difficult for managers otherwise to evaluate the quality of a scholar's output, the Impact Factor provides a seductive shorthand for helping with that process.

However, in the digital age, where individual articles, chapters and books (or any digital scholarly object) can be tracked and measured through internet technologies, the traditional Impact Factor seems to obscure as much as it reveals. As a tool from the print era, it remains wedded to an outmoded citation-averaging technique (at the journal rather than the article level); it narrowly defines impact as citation rather than use (meaning that it privileges an insular form of scholarly impact rather than a broader notion including social, developmental or industrial impact); and it renders countless research outputs invisible because it excludes thousands of journals (many from the global South) from being considered for an Impact Factor score.[83]

Because of these problems, the Impact Factor has been heavily criticised by scholars (Clobridge 2012; COAR 2012; Ernst 2010; Lawrence 2008; Lehmann, Lautrup & Jackson 2003; Patterson 2009; Rossner, Van Epps & Hill 2007; Seglen 1997; Vanclay 2012), leading many of them to express their collective dissatisfaction by writing and signing the San Francisco Declaration on Research Assessment (DORA) in 2012. The primary recommendation it makes is: "Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions."[84]

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82 Thomson Reuters Web of Science (WoS), available at: http://thomsonreuters.com/web-of-science/

83 Thomson Reuters Web of Science does not monitor all journals published worldwide, but just a selected list of 12,000 journals which it considers "top tier international and regional journals in every area of the natural sciences, social sciences, and arts and humanities." This list excludes thousands of journals from the developing world. For more information (The Thomson Reuters Journal Selection Process), see: http://wokinfo.com/essays/journal-selection-process/

84 San Francisco Declaration on Research Assessment (DORA), available at: http://am.ascb.org/dora/

Furthermore, the UK's Research Excellence Framework (REF) – the influential research assessment exercise of British HEIs – has dropped Impact Factors from its evaluation process: "No sub-panel will make any use of journal impact factors, rankings, lists or the perceived standing of publishers in assessing the quality of research outputs. An underpinning principle of the REF is that all types of research and all forms of research outputs across all disciplines shall be assessed on a fair and equal basis."[85]

Meanwhile, as scholars and managers start to move away from the Impact Factor, new opportunities are emerging to assess an output's "impact" in a more precise and comprehensive manner. The most important of these comes from the alternative metrics (or Altmetrics) movement,[86] which promotes the use of data-harvesting technologies that allow computer programmes to track digital scholarly objects as they are cited, downloaded, viewed, liked, tweeted, bookmarked and shared.[87] This permits scholars and managers to get a clearer understanding of an output's impact and use than the blunt journal-level Impact Factor citation metric. Altmetrics allows for the evaluation of any type of digital scholarly object (journal article, conference paper, policy brief, ebook, etc.) while the Impact Factor is confined primarily to formal journal articles. Moreover, alternative metrics allow scholars to gain a far deeper insight into how their outputs are being used and shared, leading to them being able to tell "impact stories"[88] that detail the real-world effects of their research (which has become a growing component of academic performance assessments).

While the alternative metrics movement is not yet as mainstream as the OA movement, it is creating new options for the many who seek to do away with or replace the Impact Factor. However, in the Southern African context in which we conducted our research, we found that these discussions were not as robust as they were in the global North. The Impact Factor remained a powerful assessment tool for scholars and managers. But through our advocacy work, we were able to raise an awareness of these competing scholarly measurement paradigms, an awareness that will likely grow as article- (or object-) level metrics become more common worldwide.

The national context

In emerging economies, such as those in Southern Africa, governments expect their universities to play a key role in national development through the production and dissemination of knowledge. This desire is revealed in policy statements by government ministers, in university mission statements and in the social discourse concerning the role of universities in developing economies. While this is generally true of the four

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85   Research Excellence Framework 2014 – Frequently Asked Questions, available at: www.ref.ac.uk/faq/all/

86   The global altmetrics movement was largely born out of the Public Library of Science's (PLOS) work in pioneering article-level metrics in 2006. This shift to a different locus of measurement opened the doors to wide-scale interrogation of previous metrics and exploration of new tools and methodologies which became mainstream in 2011/2012. For more on the ethics and rationale of the movement, see "altmetrics: a manifesto", available at: http://altmetrics.org/manifesto/

87   The most popular services for this are provided by Altmetric, available at: www.altmetric.com/

88   ImpactStory, a service that emerged from the altmetrics movement, provides scholars with usage statistics to allow them to construct narrative interpretations of their works' impact, available at: http://impactstory.org/

universities that SCAP studied, there are crucial differences in how each national government has expected them to fit into their research and development plans.

In this section we look at the national policies that have relevance for our universities' research and communication practices. These plans, strategies and policies are applicable not only to the universities themselves, but to the entire national research infrastructure. Yet as we shall see, the size, diversity and funding capacity of that infrastructure has a major impact on how the universities must engage with those policies.

Botswana

The government of Botswana has written a series of manifestos, plans and policies to guide national development priorities. Key to all of them is the role that education and research is to play in enhancing development opportunities. The University of Botswana, as the major tertiary education provider in the country, is envisaged as playing an important part in these desires, though the government hopes to expand national research capacity beyond what the university can offer. The following policy frameworks are the ones that have the most direct impact on shaping UB's own research and dissemination plans: Botswana Long Term Vision 2016; National Development Plan 10; the National Policy on Research, Science, Technology and Innovation; and the Tertiary Education Policy.

The Botswana Long Term Vision 2016 aims to transform the country into an information society (an "educated, informed nation") by the country's 50th anniversary (PTG 1997: 25). To help with the research element of this vision, the policy calls for the creation of "a National Research Council to promote, facilitate and fund research in Botswana. The council will be responsible for raising funds from Government and donor agencies, which is crucial for disciplines that do not normally attract research funding" (PTG 1997: 27–28). Though Botswana has still yet to establish this Council, the impetus for enhancing the national research infrastructure remains.

In line with the aspirations articulated in Vision 2016, the National Development Plan 10 (NDP 10) (MFDP 2009) identifies the particular strategies it will employ to reach them. While research and dissemination form part of a cluster of strategies for many of the objectives, they form the core strategy in the goal of turning Botswana into a "knowledge society." This ideal is premised on the notion that Batswana[89] "will have easy access to information to improve their lives at home and work. Information about all aspects of the economy, such as education, health, environment and business, will be available through the different information dissemination channels, which include telecommunication, electronic and print media" (MFDP 2009: 115). To do this, the government proposes the creation of various centres, funds, hubs and programmes that will be devoted to research and development, a strategy that would diversify the country's research infrastructure.

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89   "Botswana" refers to the country, "Batswana" refers to its people.

In addition to NDP 10, one of policy's objectives of the National Policy on Research, Science, Technology and Innovation is "to promote research and innovation in the areas of priority for sustainable, socio-economic development of Botswana, and foster collaborative scientific research among academic and scientific institutions and the private sector" (MIST 2012: 13). It does so by seeking to increase research capacity, improving researchers' access to competitive funding through the establishment of a National Research Fund, and facilitating "the systematic dissemination of knowledge" through "media and data repositories" (MIST 2012: 20)."

Lastly, one of three main goals of the Tertiary Education Policy (2008) is to develop "a nationally relevant and internationally competitive research capacity." Part of this objective is informed by the fact that "tertiary level research has almost exclusively been centred on the one public university (UB) with very little capacity or opportunity for research existing in the rest of the system" (MESD 2008: 14). Thus the government would like to expand that research capacity beyond UB by "embedding a culture of research through every facet of life in Botswana" (MESD 2008: 14).

In sum, these national strategies and policies establish a context in which research development is valued, new research opportunities (centres, hubs, etc.) are slowly opening, and research activity is gradually being integrated into a broader strategy. And though the documents never use the term "open access" to describe the kind of scholarly communication that they desire, the types of knowledge dissemination that they do propose – to multiple audiences – suggest that an open access approach could answer many of these policies' requirements. This is certainly the direction that UB is taking (in measured steps), as we will see below.

South Africa

In South Africa, the burden upon universities to direct their research efforts towards development-related outcomes is not as heavy as it is in other African countries where there is often a small higher education sector responsible for the nation's research output. In this context, universities form just one part of a diverse research infrastructure that includes public and private research bodies, soft-funded NGOs and profit-sustained industrial corporations. The country's 23 public universities play an important role in this multifaceted research context, but they enjoy relative autonomy, engaging in research activities of their own choosing. Yet despite this plethora of independent research effort – or, more likely, because of it – South Africa ends up enjoying a solid level of research production that has developmental applicability.

The South African government's commitment to research is exemplified in the following national plans, strategies and policies: the National Development Plan 2030, the National Research Foundation Act, the NRF Vision 2015, the Department of Science and Technology Ten-Year Innovation Plan, the National Plan on Higher Education, the National Research and Development Strategy, and the Higher Education Act.

The National Development Plan 2030 acts as the ANC-led government's broad development strategy for the country and includes a number of proposals that have

important ramifications for research dissemination activity. First, it calls for the state to "strengthen universities that have an embedded culture of research and development. They should be assisted to access private sector research grants (third stream funding) in addition to state subsidies and student fees, attract researchers, form partnerships with industry and be equipped with the latest technologies" (NPC 2012: 319). Second, it urges public research bodies (including UCT) to be mindful of national development priorities in their research, calling for the creation of "a common overarching framework to address pressing challenges in the national system of innovation" (NPC 2012: 326–327). This does not prescribe that all research activity be subsumed under a state-sanctioned developmental umbrella, but just that relevant research activity should be identifiable and connected with other efforts through enhanced coordination. Third, in keeping with the country's "differentiated" approach to higher education, the Plan wants to "develop a few world-class centres and programmes within both the national system of innovation and the higher education sector" (NPC 2012: 327), of which UCT would certainly be one.

The National Research Foundation Act established the NRF to coordinate and fund research (especially in science and technology), and to support scholarly communication activities, such as: facilitating liaisons with national and international researchers and institutions; making available scientific knowledge or technology; and promoting the provision of an information infrastructure linking research institutions in the sharing of research knowledge (GRSA 1998). Through activities like these, the NRF has become a major part of South Africa's research infrastructure. Currently, it is guided by the five principles of NRF Vision 2015 (NRF 2008: 19):

1.   Internationally competitive science, technology and innovation system
2.   Representative research and technical workforce in SA
3.   World-class science benchmarking and grant systems
4.   Leading edge research, technology and innovation platforms
5.   Vibrant national science system

More specifically, the NRF seeks to raise the visibility and effectiveness of South African research outputs by: increasing the proportion of its contribution to global research output to 1%[90]; raising the proportion of its citation intensity to 0.1%[91]; recognising 2,500 "rated researchers" in the country[92]; increasing the national patents per capita rate; and internationalising research performance assessment (NRF 2008: 16).

While the NRF's Vision seeks to make South Africa a globally recognised research player, it largely takes for granted the appropriateness of "international" (i.e. Northern) research assessment norms – which may or may not be appropriate for a developing country – as

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90   According to Pouris (2012), South Africa's share of "world's publications" reached "a peak during 1987 (0.65%) and then a decline, which appears to have reached its lowest point in 2003 (0.47%). Since then, the share increased gradually to 0.65% in 2010 and reached the 1987 peak."

91   According to King (2004), citation intensity refers to the ratio of citations to a nation's scientific papers to its national GDP. In 2004, South Africa's citation intensity was well below 0.05% while Greece was at 0.1% and other nations (such as Singapore, Finland, the UK and USA) were well above that.

92   For more information on the current state of NRF rated researchers, see NRF 2012.

well as the value of the conventional scholarly communication model (in which a large proportion of outputs remain unavailable to the public).

The Department of Science and Technology's current ten-year plan provides a roadmap for transforming South Africa into a "knowledge-based economy, in which the production and dissemination of knowledge leads to economic benefits and enriches all fields of human endeavour" (DST 2008: vii). It is premised on "the need to accelerate and sustain economic growth" (DST 2008: vii) while increasing spending on R&D to 1% of GDP and strengthening its international research collaborations (DST 2008: 30).

While the plan does not prescribe how scholarly communication should take place, it suggests that formal peer-reviewed journal articles are the most valuable vehicles for disseminating research results, stating that "the principal qualitative measure of knowledge production is the output of original articles published in scientific journals. From 1990 to 2004, South Africa's output averaged about 7,000 articles a year, despite indications of increased funding" (DST 2008: 26). This sentiment is corroborated not only in other government research policies, but in university dissemination strategies. Only outputs produced in specified WoS or DHET-vetted publications count as "knowledge".

While the plans above speak to research in a broad sense, one of the key priorities of the National Plan on Higher Education is to "sustain current research strengths and to promote the kinds of research and other knowledge outputs required to meet national development needs, and which will enable the country to become competitive in a new global context" (GRSA 2001: 60). When the Plan was written in 2001, part of the impetus for this focus came from an anxiety about the drop in South Africa's proportion of ISI-rated research outputs in the mid-1990s, an outcome that the writers suggested was due to scholars' shift from basic research to more applied research (GRSA 2001: 61).

However, in the post-apartheid context, it could be argued that this was strategically valuable to shift attention from basic to applied research so that the country's intellectual power could have a greater impact on the nation's poor. Indeed, the Plan acknowledges there might be other ways of assessing national research productivity than only through the ISI indexes, but it goes no further (GRSA 2001: 62). Rather, it simply notes these concerns while maintaining its belief in the accuracy and credibility of the ISI indexing mechanism. This ambivalence remains prevalent in South Africa today. While many educationalists continue to acknowledge the limitations of the ISI/WoS ranking system in the Southern context, the country's policymakers, funding agencies, universities and scholars still rely to a high degree on the WoS index to assess their research performance.

Lastly, the Higher Education Act's Policy and Procedures for Measurement of Research Output of Public Higher Education Institutions (GRSA 2003) incentivises the production of scholarly research outputs through a unique subsidy system that creates a virtuous funding cycle in which the production of research at a university leads to it obtaining money from the government to fund further research projects. According to Mouton (2010: 25), "as of 2005, an amount of approximately USD180 million was available (on a competitive basis) for rewarding research output. The monetary awards for publication units [i.e. a single WoS-rated journal article] increased significantly from approximately

USD9,000 in 2005 to nearly USD12,000 in 2009." For universities and scholars, this system has a powerful effect on structuring research and dissemination decisions.

Once paid, each university handles the distribution of these subsidies differently, with some paying a portion of it into individual scholars' research accounts and others paying a portion into the relevant faculty's research fund. Other portions may be used by the central administration for other purposes. (At UCT, individual scholars do not receive any of the subsidy directly, but enjoy the expanded pool of financial resources that the faculty and university obtain as a result of it.) Thus, every year, South African universities compile and submit a publication count to the DHET, which then allocates subsidies based on how many and which types of recognised outputs they produced. However, the policy "is not intended to measure all outputs", but only "the major types":

- Articles published in journals listed by the ISI, the DHET[93] and the IBSS (International Bibliography of the Social Sciences)[94]
- Peer-reviewed books/chapters in books[95]
- Peer-reviewed published conference proceedings
  (GRSA 2003: 4)

However, this South African Post Secondary Education (SAPSE) list of accredited publications does not include "correspondence to editors, abstracts or extended abstracts, obituaries, book reviews, news articles, advertorials, and editorials" appearing in those journals.[96]

In sum, these national policies assume that research can lead to economic growth which can, in turn, lead to social development. They are not prescriptive, but seek to establish an enabling framework that optimises research production. Because of the size, diversity and relative wealth of this research sector, the government believes that, by allowing the various research entities to pursue their own research desires, they will end up producing a multitude of outputs, of which a good portion will have commercial or developmental applicability. However, this powerful production system is not yet backed by similarly imaginative dissemination policies, as they rely wholly on a traditional mode of scholarly communication through commercial publishers (which are typically not OA).

Mauritius

In Mauritius, the Ministry of Tertiary Education, Science, Research and Technology (MTESRT), the Mauritius Research Council (MRC) and the Tertiary Education Commission (TEC) are the bodies driving higher education, research and innovation. Their primary ambition is for the island nation to be transformed into "a knowledge-based economy" through greater education, research, innovation, collaboration, connectivity and capacity: "henceforth, knowledge-based industries will be an increasing source of

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93 DHET-approved list of SA journals, available at: www.researchoffice.uct.ac.za/usr/researchoffice/publication/SA-JournalList2013.xlsx
94 IBSS bibliography, available at: www.researchoffice.uct.ac.za/usr/researchoffice/publication/IBSS-2013-List%20of%20accredited%20journals.xlsx
95 UCT Research Office publication count overview, available at: www.researchoffice.uct.ac.za/publication_count/overview/
96 Ibid.

value added for the economy and a significant component of the new economic model. To that end, [the government] is promoting a Knowledge Hub agenda in which tertiary education will be given greater prominence" (MESR 2006: iv).

This desire has important implications for scholarly communication, in that a knowledge economy is premised on the easy flow of information and ideas, unconstrained by legislative, technical or financial obstacles (except perhaps for commercial purposes, as with patented knowledge). Thus the government has placed great emphasis on reducing the impact of these various hurdles. But because it is also keen to exploit the commercial potential of knowledge production, it has not yet stressed an "open" approach to knowledge. It focuses more on person-to-person connectivity and collaboration. This fact dictates the current strategies taken by the University of Mauritius, discussed below, which aims to be a "knowledge hub", but not necessarily an *open* knowledge portal.

The most relevant scholarly communication-related policies nationally are the TEC Publishing Grant Scheme and the Education and Human Resources Strategy Plan 2008–2020.

The TEC allocates government funding to Mauritian HEIs. According to the TEC's Strategic Plan 2007–2011, its vision is to "Make Mauritius the Intelligent Island of the Region in the Global Village" while its mission is to "Position Mauritius in the Region as a world-class Knowledge Hub and the gateway for post-secondary education" (TEC 2007: 5). Though it typically strives to achieve this through high-level funding efforts, it also promotes scholarly communication through the Publication Grant Scheme which provides "up to MUR25,000 [USD806] for the publication of books and research materials."[97]

The Education and Human Resources Strategy Plan 2008–2020 (MECHR 2009) states that "the main objective for the tertiary education sub-sector is to make Mauritius a Knowledge Hub to serve the Region and a Centre for Higher Learning and Excellence" (MECHR 2009: 112). It shares how research must contribute to the knowledge economy, how it should be attentive to industrial requirements and how it should be curated and disseminated. The plan suggests why this is so important to policymakers:

> *To ensure the success of the knowledge hub, efforts will be undertaken to strengthen the linkages between tertiary education, government and industry. Knowledge hubs generate new basic knowledge of relevance to many industries, as well as applied knowledge that is directly and immediately relevant to local industries. They also capture knowledge generated elsewhere, nationally or internationally, and develop this further to meet specific local needs. TEIs will be called upon to design their programmes with the assistance of industry.* (MECHR 2009: 117)

In sum, Mauritian national education policies stress the importance of innovation (the commercialisation of knowledge), the knowledge economy, knowledge hubs, research

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97　The TEC Publication Grant Scheme, available at: http://tec.intnet.mu/resrch_pubgrnt.php

for development and inter-disciplinary cooperation. This helps to explain why scholarly communication plans at UoM are focused so much on collaboration, consultancy, connectivity and commercialisation rather than, say, openness, non-traditional outputs or alternative metrics. For the government, research for development is ideally channelled through industry so that it spurs economic growth along the way. Through research-based industry-led growth, the country will develop. However, as we will later argue, this approach presumes that industry is the only audience that has a stake in research that could lead to broader social development. It is a narrow conception of research dissemination.

Namibia

In Namibia, the young nation faces a number of social and economic challenges, thus the government is keen for research to make a direct contribution to national development. The University of Namibia, as the major producer of research in the country, is keen to oblige. Here we will look at that intention as expressed in the government's Vision 2030, National Development Plan (NDP4) and the Research, Science and Technology Act.

The major directive guiding all of Namibia's governmental policies is Vision 2030 which is meant to "promote the creation of a diversified, open market economy, with a resource-based industrial sector and commercial agriculture, placing great emphasis on skills development."[98] It also calls for the country to move towards a "knowledge-based economy" through ICT development, production technology, education and training, policy expansion and so forth (Government of Namibia 2004a: 77–100). As the flagship university of the country, UNAM is imagined to play an important role in this process.

The current National Development Plan (NDP4) is defined by three overarching goals: high and sustained economic growth, increased income equality and employment creation. To reach these ends, this NDP has identified key areas of focus that will create the necessary momentum for higher economic growth, namely logistics, tourism, manufacturing and agriculture.[99] Higher education is not the focus of the plan, though its role is implied in the priority given to increased research and development (R&D) funding and activity, as well as the government's desire to "promote the establishment of centres of excellence, more applied research, and additional institutions of higher learning" (Government of Namibia 2012: 121).

Lastly, the Research, Science and Technology Act aims to "provide for the promotion, co-ordination and development of research, science and technology in Namibia" by establishing a National Commission on Research, Science and Technology (NCRST) to regulate, oversee and fund local research efforts (Government of Namibia 2004b: 2). The Commission has only recently been established, but the law is intended to enhance the national research infrastructure and strengthen its relationship to development. However, the Act has come under criticism by Namibian NGOs, research entities and civil society

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98   Government of Namibia, Vision 2030 Overview, available at: www.gov.na/vision-2030
99   Government of Namibia, Fourth National Development Plan (NDP4), available at: www.gov.na/ndp-4

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bodies which claim that the law serves more to stifle and control research than promote and open it. These organisations argue that the law:

- defines research too broadly (such that a student's essay or a piece of investigative journalism could be defined as "research" and therefore subject to the Act)[100]
- stacks the commission with political appointments, minimising the participation of researchers, academics and civil society organisations
- gives the president of the country absolute discretion in issuing "general policy directives" to the commission, thereby limiting its autonomy and independence
- requires all researchers and research institutions to register with the Commission and gain permission to conduct research from the relevant Minister.[101]

Though this is an issue that will likely take some further time to sort out, the critiques levelled at the Act remind us that there is a fine line between what a government calls "coordination" and what researchers experience as simply "control". While SCAP has, in general, supported the idea of vertical policy alignment – such as when university research fits in with institutional and national research policy aims – this support has been predicated upon a policy structure informed by civil society participation, openness, transparency and intellectual freedom. Policy "alignment" or "coordination" should not act as a discursive tool to legitimate the suppression of research activities. At the moment, it is difficult to tell what impact this Act will have in the future, but it will likely determine whether Namibia becomes a site of research innovation or stagnation.

The institutional context

For the most part, the four Southern African universities profiled below try to align their research and communication policies with the strategies, plans and policies of their governments. But due to national policy differences, variant institutional missions and distinctive historical legacies, cultural norms and scholarly practices, the institutional policies that these universities have developed to guide their research and dissemination activities are unique. They share certain features, of course, as these institutions are engaged in the same global economy and shaped by the same international academic trends, but they remain focused on particular objectives that speak to their current visions for their futures. In this section we look at how each university has tried not only to align to with national government policies, but how they have responded to changing international practices. Through this, we will gain a greater understanding of how these universities see themselves and how they should approach scholarly communication.

University of Botswana

At an institutional level, the University of Botswana's Strategic Plan – "Strategy for excellence" – is closely aligned with the goals of the government's National Development Plan

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100 Namibia Economist (2012), Research Act a threat to researchers – MISA, available at: www.economist.com.na/general-news/2169-research-act-a-threat-to-researchers-misa

101 For the three final points of this list, see Delme Cupido (19 October 2012), Clear and present danger, OSISA, available at: www.osisa.org/law/blog/clear-and-present-danger

(NDP 10) as well as the Long Term Vision 2016. Its scholarly communication approach also emerges from this sense of policy alignment, though the university has had to translate some of the broader national goals when it comes to dissemination issues. These institutional strategies are best expressed in UB's mission and values, Research Strategy, Digital Repository Policy and Performance Management System guidelines.

At the heart of the university's mission is a commitment to national socio-economic relevance, research excellence and the broad dissemination of knowledge.[102] Two of the ways that it will achieve these goals is through "advancing scholarship and generating research through the discovery, integration, dissemination and application of knowledge" and by "providing leadership in responding to the nation's cultural, economic, political scientific, social, technological and industrial needs and contributing to the qualitative development of Botswana's higher education system."[103]

The UB University Research Strategy (2008) elaborates on and sharpens the focus of a previous Research and Development Policy from 2002 when UB first intimated its desire to move towards a more research-intensive mission. In that earlier document, UB established three core desires that continue to drive its policy today: it seeks for UB research to be locally relevant, internationally recognised and widely shared (UB 2002). Though the updated Strategy does not spell out the precise mechanisms by which research outputs should be disseminated, scholars often produce a wide variety of outputs that achieve one or more of the policy's desires.

To help UB achieve its "goal of being a research intensive higher education institution by the year 2021," it has sought "to create an effective mechanism for storing, managing and processing research information" (UB 2009: 2) by investing in an IR called UBRISA (University of Botswana Research, Innovation and Scholarship Archive). Established in 2009, "the initiative is open access and openarchive compliant" and seeks to increase "the institution's visibility, status and public value" (UB 2009: 2). Its objectives are to:

- promote and encourage the dissemination of research findings
- increase the level of African content in scholarly publications that are unduly dominated by Western academic discourses
- enhance socio-economic development through research that feeds into national systems of technology transfer and innovation
- strategically increase the visibility of the University of Botswana nationally and internationally in scholarship and knowledge creation, application and exchange
- preserve the University's intellectual heritage for future use. (UB 2009: 2)

The administration's ambition is that "all vetted research outcomes whether published or not, and other works be deposited in UBRISA as soon as possible after completion of the research. The premise of the policy is that knowledge is a public good and that publicly funded research outcomes must be made widely available and accessible, in line with international practice" (UB 2009: 2). The IR will host the following research outputs:

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102 UB Vision, Mission and Values, available at: www.ub.bw/content/id/1576/Vision,-Mission-and-Values/
103 Ibid.

- papers
- peer-reviewed published articles
- pre-prints
- monographs
- electronic books
- book chapters
- vetted conference papers
- theses and dissertations
- other research outputs that are not necessarily meant for publication
- computer programs
- artistic works (photographs, film/video clips, paintings, etc.)(UB 2009: 3–4)

Though the policy stops short of mandating that all UB scholars deposit their work on the IR, it suggests that other policies – such as the performance management system (PMS) – will be able to achieve that compliance over the next few years (UB 2009: 3).

The UB PMS comprises a complex auditing and accountability process that is based, in part, on goals that academics set with their supervisors. The "PMS was inspired by the New Public Management doctrine emphasising efficiency" (Marobela & Andrae-Marobela 2013: 173) and the "audit revolution" (Deacon, Osman & Buchler 2009; Lomas 2004; Power 1997; Shore & Wright 1999; Strathern 2000; Wood 2010) that has swept across higher education in the global North. It asks employees to benchmark themselves, identify production targets, and then assess whether they have lived up to their personalised agreements. However, due to questions raised about its efficacy, certain elements of the PMS were put on hold in 2012.

Nevertheless, the PMS is meant to appraise and motivate scholars in almost every domain of academic activity (teaching, researching, supervising, attending departmental meetings, etc.). But of the three broad categories assessed by the PMS – teaching, research and service – scholarly communication falls under "research and publications" activity which is supposed to take up between 20–40% of scholars' time (while teaching should comprise 55–75%; and service and academic leadership should comprise 5–20%).

To assess the value of scholars' research productivity, the PMS allocates points to a list of outputs based on their value in the eyes of the management. It reveals a conventional preference for high-Impact Factor, peer-reviewed journal articles (with eight points minimum), "highly commended" books (eight points), books (six points), articles in nationally listed journals (six points), followed by conference papers, keynote addresses, seminar papers and other types of research outputs (one to four points each). These scores are then tallied and weighted according to the "research and publications" weighting that each scholar uses to assess his or her own performance.

This point system represents an attempt by the administration to balance "our dual responsibility for academic excellence, together with the importance of advancing the intellectual and human resource capability of the Nation" (UB 2008a: 27). In this

respect, the PMS is successful because UB scholars produce a good proportion of outputs in each of the listed genres. However, the key element missing from this system is any recognition of whether an output is profiled on UBRISA or published in an OA format.

In sum, while UB's research and dissemination policies are aligned with the government's research and development agenda, they are not necessarily in alignment with each other. This is because the university has had to interpret the broad desires of the national interest in line with changing trends in scholarly communication. It has developed multiple strategies simultaneously – such as the Research Strategy, Digital Repository Policy and PMS – to achieve international recognition, national relevance and broad distribution through its research outputs. However, as we have seen, these different strategies have not always been tightly integrated: for instance, the Digital Repository Policy promotes open access dissemination of scholar-submitted materials, while the PMS does not incentivise open access dissemination or scholarly submission to UBRISA at all. This ends up rendering the former policy less effective since it is not reinforced by the PMS. Such discrepancies are to be expected in the early phases of a policy roll-out, but it can nonetheless hamper the effectiveness of the institution's research and dissemination effort.

University of Cape Town

At an institutional level, UCT's scholarly communication policies are aligned with the government's to the extent that the university is given the freedom to make its own autonomous decisions regarding how it incentivises, produces and disseminates research. As one of many elements in a diverse national research infrastructure, UCT is able to determine its own research and communication policies, though due to the lucrative funding opportunities afforded by the SAPSE subsidy system, it tends to reinforce the one established by the DHET, which prioritises the publication of high-Impact Factor international journal publications and books.

These commitments are best expressed in the UCT Mission and Values, Strategic Plan and Research Strategy (as well as each faculty's assessment and promotion guidelines, which we will discuss in Chapter 5).

At the heart of UCT's mission is a commitment to networking, research, social relevance, quality and diversity:

> *UCT aspires to become a premier academic meeting point between South Africa, the rest of Africa and the world. Taking advantage of expanding global networks and our distinct vantage point in Africa, we are committed, through innovative research and scholarship, to grapple with the key issues of our natural and social worlds. We aim to produce graduates whose qualifications are internationally recognised and locally applicable, underpinned by values of engaged citizenship and social justice. UCT will promote diversity and transformation within our institution and beyond, including growing the next generation of academics.*

This mission is informed by values that encourage the institution to create "an encompassing ethos" which promotes excellence, social responsiveness, transformation, human rights and communal responsibility.[104]

According to the UCT Strategic Plan (UCT 2009: 2), the university is a "research-led" university whose goals are to:

- enhance UCT's position as an *Afropolitan university* by making it an intellectual meeting point for scholars who have an interest in Africa's place in the world.
- strengthen UCT's *international research profile* through academic exchanges and research dissemination and partnerships worldwide, especially South-South links
- enhance *graduate attributes* by equipping students with knowledge and understanding of and exposure to continental and international contexts
- internationalise the student experience, through recruiting an internationally diverse student body and *innovative curricula development* relevant to Africa and beyond
- ensure that *staff development* includes skills for teaching diverse student bodies as well as significant international exposure
- contribute to the resolution of problems of global significance through a wide range of *socially responsive* activities, including research, teaching and policy engagement.

To achieve these goals, the university has committed to a number of strategies including raising research visibility (through improved ICT tools), making research relevant to teaching and socially responsive work, bringing research into teaching and strengthening UCT's "role in addressing key development challenges facing our society through engaged research, policy and advocacy" (UCT 2009: 14).

Meanwhile, the UCT Research Strategy follows the principles stated in its plans and policies listed above, such as having a research-led identity shaped by a commitment to: academic freedom; research informing all activities; disseminating knowledge that addresses key challenges facing society; protecting "curiosity driven research"; nurturing creativity; and stimulating international research linkages.[105]

In sum, between UCT's various research policies, plans and strategies, two key points emerge regarding scholarly communication. First, the university wants to produce and disseminate research that both secures greater international recognition (prestige) and contributes to dealing with local challenges (relevance). Unfortunately, due to South Africa's relative marginality in global affairs, it is difficult for UCT scholars to achieve both at the same time. This is not always the case, but often, the more that scholars make their research relevant and useful for a particular local context, the more difficulties they face in making it appeal to those who decide what is globally "excellent" and "important" (i.e. Northern journal editors). Second, UCT places a great deal of trust in conventional

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104 UCT Statement of Values (adopted in 2001, currently under review), available at: www.uct.ac.za/downloads/uct.ac.za/about/introducing/uctvaluestatement.doc

105 UCT Research Strategy, available at: www.researchoffice.uct.ac.za/usr/researchoffice/info/policies/UCT_researchstrategy.doc

scholarly communication mechanisms – such as commercial journal publishers who usually locate outputs behind subscription paywalls – to achieve the "impact" it desires. Along with the DHET subsidy policy, UCT appears to accept the verdict of the Thomson Reuters WoS index and its Impact Factor for deciding what is "excellent" scholarship internationally. Furthermore, the university's research policies also do not say anything about whether its scholarly outputs should be made open access, a silence that favours that status quo in which scholar-to-scholar outputs are more likely to be disseminated through traditional closed methods.[106]

University of Mauritius

At an institutional level, UoM's official scholarly communication approach is very much in line with national strategies. It is best expressed in the UoM's mission and values, the UoM Strategic Plan 2006–2015, the UoM Strategic Research and Innovation Framework 2009–2015 and the academic staff performance assessment guidelines.

At the core of the university's mission is a commitment to scholarly "dissemination" to both Mauritians and the international community: "The core mission of the University is the creation and dissemination of knowledge and understanding for the citizens of Mauritius and the international community." This is further inflected by the university's vision which imagines its role as a connective one globally: "The University of Mauritius aspires to be a leading international university, bridging knowledge across continents through excellence and intellectual creativity."[107] These sentiments are in line with the government's desire for the island to become a regional knowledge hub and a space characterised by high levels of collaboration and connectivity.

The UoM Strategic Plan 2006–2015[108] provides the roadmap that the institution is currently using to fulfil its mission and values. It is comprised of six strategic directions: knowledge creation; knowledge diffusion; investing in resources; quality culture and good governance; national, regional and international collaborations; and community outreach. Each of these directions contains a number of sub-goals and strategies, three of which deal with scholarly communication at some level: fostering innovative e-learning systems (laptops, e-tools, etc.); increasing provision for state-of-the-art technologies (Excellence Parks, e-conferencing, etc.); and reinforcing UoM's networking role (regional and international collaboration, exchange programmes, strategic partnerships, etc.).

While these goals are important for enhancing the dissemination of Mauritian-produced knowledge, they do not speak to some of the core issues that define current debates around scholarly communication, such as openness, dissemination formats and metrics. They deal rather with technology development, infrastructure capacitation, skills training, collaboration (both virtual and physical) and networking which, as we will discuss later,

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106 At time of publication, UCT senior management was engaged in discussions about adopting a more pro-open access approach to scholarly communication.
107 UoM, Mission and Vision of the University, available at: www.uom.ac.mu/ABOUTUS/INTRODUCTION/missionvision.html
108 The University of Mauritius Strategic Plan 2006–2015, available at: www.uom.ac.mu/ABOUTUS/StrategicPlan/index.htm

do not always achieve their developmental potential if they are constrained by inappropriate policies, paradigms or incentives.

The UoM Strategic Research and Innovation Framework (SRIF) 2009–2015 seeks to: foster and grow an active research culture that inspires discovery and innovation with emphasis on research of excellence that is world-significant; strengthen inter-disciplinary and collaborative research through increasing the number of functional and strategic internal and external links; build future research and research capacity; and increase research income from external sources to support more research broadly.[109] These goals stem mostly from a desire to ramp up UoM's research intensity, effectiveness and commercial viability. This would appear to be the next logical step in the institution's development. As the SRIF's Executive Summary states, "from this research-informed base, the University is now well underway to become a research intensive institution."[110]

Lastly, for individual scholars, the most important policy shaping their actions at a personal level is the UoM Academic Staff Performance Assessment Guidelines, which delineate the rewards and incentives attached to their research activity. It represents the university's key source of leverage in influencing the quantity and quality of institutional research activity.

We will discuss university rewards and incentives in more detail in Chapter 5, but for now it is important to note that at UoM, these guidelines form a crucial part of the scholarly communication policy landscape. They are based on a simple point system in which various types of scholarly outputs are allocated a numerical value that are then weighted according to whether the outputs are considered of a "very high category" (1 × full mark), "high category" (0.8 × full marks) or "average category" (0.6 × full marks) and totalled to give assessors a raw score to grade them. This process becomes operational when a scholar decides to apply for promotion, which may happen after a few years in a given rank. The point system rewards the publication of internationally published books, journal articles, book chapters and refereed papers in conference proceedings over those published nationally (by a two-to-one margin) and provides mild recognition for alternative outputs such as reports, technical papers, briefings and so forth.

However, the major piece missing from this promotion policy is any strategic concern for dissemination practices beyond a traditional understanding of scholarly communication. Scholars are rewarded for publication, but without any regard to whether it is open or closed. Essentially, while the policy pushes for research publication, it does not imaginatively try to use the act of dissemination to achieve national development goals by making sure that UoM research reaches the broadest possible audience in the most open fashion.

109 UoM Strategic Research and Innovation Framework (SRIF) 2009–2015 Executive Summary, available at: www.uom.ac.mu/provcr-ci/research/ResearchStrategy/EXECUTIVESummary.pdf
110 Ibid.

University of Namibia

At an institutional level, UNAM's official scholarly communication approach is very much in line with the national policies discussed above, though it has had to translate the desires of the government creatively for its own academic context. This process – of policy alignment and translation – is best captured in UNAM's vision and mission, UNAM's Research Strategy, UNAM's 5-Year Strategic Plan and the university's various promotion and teaching and publication assessment guidelines.

At the centre of the UNAM vision and mission is a commitment to developing the potential and prospects of the Namibian people. The vision of the university is to:

> *engage with society in the creation and dissemination of knowledge, through teaching, research and advisory services, and a commitment to lifelong learning; thereby becoming a treasure house of knowledge at the service of national development, and available to all in forms directly relevant to the improvement of the quality of their lives.[111]*

This is further inflected by the UNAM mission to:

> *engage in socially and nationally relevant, academic and technical training, research and educational programmes with the involvement of all stakeholders in a conducive environment for learning, innovation, knowledge creation, professional development, functional skills development and development related competencies, within the cultural context of the Namibian people.[112]*

In order to achieve this, the university has committed to a number of operational principles, including: prioritising "applied research" and "inter-disciplinary approaches" to solving "real-world problems"; serving as "a repository for the preservation, development and articulation of national values and culture, through the promotion of Namibian history, art and languages"; undertaking "basic and applied research, with a view to contributing to the social, economic, cultural and political development of Namibia"; providing "advisory, consultancy, and extension services throughout the country, with the view to promote community education and appropriate know-how, thus enhancing Namibia's productivity and socio-economic development."[113]

What this vision and mission suggest is that the university sees itself as a servant to society, seeking to make a direct contribution to the development of Namibia with teaching, research and service that is locally relevant. While mindful and interested in also securing international recognition and prestige, the top priority by far is having an institution that is responsive to Namibia's immediate and long-term needs.

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111 UNAM Vision and Mission, available at: www.unam.na/about_unam/vision_mission.html
112 Ibid.
113 Ibid.

In 2005, UNAM adopted an institutional research strategy that aimed for the university to "become a research institution of international repute in various key areas of research excellence which create and share knowledge needed for the upliftment of the quality of life of our people" (Kiangi 2005: 1). While the strategy emanated from the values of the university's mission and vision discussed above, it took on a more ambitious language as far as impact goes, pushing for research not only to impact nationally, but regionally and internationally as well. It is a document that asserts an ambition for the university to see itself as more than a teaching university, but one with a solid research contribution to make. Generally, the research strategy intends to:

- guide UNAM to carry out research relevant to national and regional importance
- encourage interaction with, and attract eminent scholars of repute who will catalyse research activities, and raise the research profiles of the various research groups in different areas of excellence, to ensure that the University conducts research that makes a difference
- increase the proportion of staff engaged in internationally excelling research
- improve research funding, and the overall financial return on investing in research
- promote research collaboration within the University, and with the private and public sectors, and any associated strategic alliances, in order to encourage commercial exploitation of the University's research outputs
- promote a culture of research within the University where all staff members willingly cherish the novelty of engaging in research, where trust and confidence prevail to support free expression of ideas, as these are essential for discovery and innovation
- develop a framework for quality assurance, monitoring and evaluation. (Kiangi 2005: 4)

This Research Strategy marks a key moment for the university in terms of broadening its mission to include greater research commitment in an otherwise teaching-oriented institution.

The current UNAM Strategic Plan also identifies a number of ambitions aimed at improving its teaching, research and service dimensions. First, UNAM seeks to increase its number of refereed publications from a baseline of 90 to 160 by 2015 and its number of other publications from a baseline of 305 to 400 by 2015 (UNAM 2011d: 15). This shows a desire by the university to ramp up its research activity during this five-year period. It also reveals how important non-refereed outputs remain for the university because scholars are incentivised to produce outputs not only for other scholars, but also for the government, industry and civil society.

Second, UNAM aims to "strengthen international liaison and collaboration" by raising the number of existing and operational international cooperations from a baseline of 30 to 80 by 2015 and by increasing the number of active collaboration agreements from a baseline of 14 to 80 in 2015 (UNAM 2011d: 23). This represents a massive upgrade in in collaborative interactions, but the stability and growth of the institution bodes well for such ambitions.

Third, UNAM wants to "enhance community engagement" by raising the number of successful community interactions from 35 in 2011 to 50 in 2015. It also wants to raise its stakeholder satisfaction rating from 20% in 2011 to 60% in 2015. It will do this by conducting surveys, formulating and implementing policy on community service and engagement, and documenting and publicising its activities (UNAM 2011d: 17). This will extend the reach of the university's research to the non-academic audiences of the country who would also benefit from its results.

Fourth, according to UNAM's various teaching, publishing and promotion assessment guidelines (UNAM 2011a, 2011b, 2011c), academic staff are expected to spend about 60% (24 hours/week) of their work time teaching and giving lectures, 30% (12 hours/week) doing research and publishing and 10% (four hours/week) doing service, administration and community work. As we will see in the next chapter, these proportions are difficult to achieve for many Faculty of Humanities and Social Sciences (FHSS) scholars who find themselves stretched in terms of teaching and administration work.

However, when research outputs are published, they are evaluated and rated by the university depending on their type and distribution mechanism. Academic books, book chapters, journal articles, academic conference/workshop proceedings, reports (consultancy, technical and commissioned), teaching manuals, contributions as editor and creative works are all considered published works worthy of assessment (UNAM 2011a, 2011b). The point allocation system rates the value of these outputs for promotion purposes, giving greater weight to international peer-reviewed outputs compared to locally published non-reviewed items (which is similar to the other university assessment systems we looked at). Though none of these take into account whether an output is open access, the sheer variety of outputs recognised in the system allows for scholars to produce outputs that can reach a diverse number of audiences locally and internationally.

These guidelines and policies are suited for an academic environment characterised by high levels of teaching engagement, modest levels of doctoral degree attainment and mild levels of research publication productivity. They recognise both teaching-oriented and publication-oriented career choices, though they signal a desire for more research production through greater status and financial rewards for those who achieve high levels of publishing productivity.

Lastly, UNAM's new Scholarly Communications Policy (UNAM 2013) – developed during the university's engagement with SCAP – accepts and promotes the need for open access dissemination practices, stating:

> *The University recognises that as a largely public-funded institution, it has an obligation to share its research findings and scholarly outputs with all stakeholders and the wider society. It also recognises that the Open Access model of scholarly communication is a means to advance research. It allows scholarly outputs to reach a much wider audience, and thus to be cited more often, which raises the profile of the author/knowledge producer and the University.* (UNAM 2013: 8)

It goes on to state that, "the fundamental purpose of the Scholarly Communications Policy is to increase access to information, knowledge, research, and artistic and creative works, in order to facilitate the academic enterprise at the University and advance the progress of society" (UNAM 2013: 5). With this open access commitment in mind, the Policy (UNAM 2013: 5–6) aims to:

1. provide a framework and guidelines for communicating UNAM scholarly outputs
2. raise the profile of UNAM's research and enhance its impact and contribution to national development
3. establish common standards of academic writing and scholarly outputs at UNAM
4. ensure quality by promoting adherence to best practices in UNAM's outputs
5. make UNAM's outputs accessible in different formats to different audiences
6. establish sustainable management strategies for communicating UNAM outputs
7. strengthen the preservation and archiving of UNAM's scholarly outputs .

The policy goes on to discuss other critical areas of concern, including quality assurance practices, types of outputs covered by the policy, the role of the new IR, the meaning of the policy for the university's various research centres, the role that UNAM Press will play in making the policy effective and various budgetary issues for implementing the policy. And though this policy has only just been ratified, it likely marks the beginning of a new era for UNAM research and its visibility.

Analysis

In this chapter, we have explored the policy landscapes shaping research and communication activities at Southern African universities. As we have seen, the international context is being radically reshaped by the OA movement, which has been embraced by numerous funders, institutions and scholars. It is turning conventional understanding of scholarly communication on its head. The global context is also being informed by provocative demands for a new type of scholarly metrics, one that goes beyond the traditional Impact Factor towards alternative or complementary metrics that leverage the data-generating capacity of the internet. These alternative metrics seek to broaden the social and developmental meaning of a scholarly output's "impact".

In Botswana, the government has created an internally consistent set of policies related to transforming the country into a participant in the knowledge economy while also diversifying its industrial capacity. This includes a focus on research production at both the academic and commercial level. While these policies do not deal directly with scholarly communication, they rely on a traditional understanding of what that communication would entail. This has an important knock-on effect for the university context where research is produced.

At UB, scholarly communication is imagined as fitting into the government's broader objectives surrounding research production, especially national socio-economic relevance, research excellence and the broad dissemination of knowledge. To help achieve that, the university has invested in an IR to profile and disseminate research, and a PMS to motivate the production of research. It has not, however, utilised the policy space to

leverage these innovations because they are not aligned in terms of promoting open access publication. The IR establishes the technological means to disseminate UB scholarship openly, but because there is no mandate for scholars to submit their outputs to the IR, nor is there any reward (in terms of greater points offered by the PMS) for them to produce OA outputs, these miss a critical opportunity for UB to disseminate their research broadly to the national community. Thus, UB achieves policy alignment with the government, but not with itself internally.

In South Africa, the government has supported the development of a diverse national research infrastructure with multiple research bodies and funds to leverage the country's intellectual capacity for development. These policies broadly seek to transition the country to a more knowledge-based economy. But the government has also had a major impact on how university research is communicated by providing subsidies for research published in ISI/WoS-listed journals, DHET-listed publications and peer-reviewed books and conference proceedings. These subsidies reinforce a vision of research dissemination based solely on scholar-to-scholar communication, and only the most prestigious forms at that. The policies say nothing about whether such outputs should be open access, thereby missing an opportunity to broaden the impact of South African scholarship beyond the scholarly community.

At UCT, the university research benefits from the government's SAPSE subsidy policy which incentivises high-prestige scholar-to-scholar communication. This also suits UCT's desire to be a highly ranked university as those rankings are partially determined by the number of outputs a university produces in WoS-rated journals. But the university is also seeking to assure that its research is more developmentally relevant for the broader community and that it takes on more of an "Afropolitan" identity through greater linkages with other scholars on the continent. At this point, UCT has largely assumed that these goals can be met through a conventional scholarly communication model, as it has only recently started to engage with how OA dissemination strategies might benefit its goals.

UCT's research policies are fully aligned with the government's research plans. This is mainly because the government has sought to create an enabling research framework into which the diverse elements of the national research infrastructure can fit according to their own strengths and weaknesses. That is, the government is not highly prescriptive about the type of research than any one university should carry out, but has established a diverse set of bodies and funds to incentivise universities to contribute to that broader research mission on their own terms. In this way, UCT is able to leverage its particular capabilities not only to achieve its own research goals, but to allow for its scholars to contribute to the government's national research goals as well. This is a crucial point: the fact that UCT is just one part of a broad and diverse national research infrastructure allows it to retain the autonomy it desires because it shares the country's research burden with multiple other entities. This is unlike the case at UB, UoM and UNAM which must shoulder a high proportion of the country's research requirements because it does not enjoy the support of a robust national research infrastructure. Thus, UCT's research and dissemination policies are in line with the government's, but they have not kept pace with the changing international policy landscape.

In Mauritius, the government has created a tightly focused set of policies and plans related to transforming the island from a material economy to a knowledge economy. Its policies seek to turn the island into a knowledge hub for the region by embracing technology, innovation, research, collaboration and connectivity. While these policies do not deal directly with scholarly communication, they rely on a traditional understanding of what that communication would entail.

At UoM, scholarly communication fits in with the broader national objectives surrounding research production, but it does not establish how the traditional scholarly communication model either helps or hinders university research in achieving these objectives. It takes for granted that these objectives can be achieved through either a conventional scholar-to-scholar communication model that is largely mediated by high-impact international journals or a consultancy contract model where the university's research is bound up in the intellectual property regimes of industrial partners. In both cases, this impacts the ability of the university's research to gain visibility, to enhance development and to reach a broader audience that might be able to utilise it for social or developmental purposes. Thus, while UoM's policies are in alignment with the government's, it is not clear that those shared policies – which rely on closed, not open, dissemination strategies – are the best ones for meeting their own stated objectives of ushering the country into a knowledge economy.

Lastly, in Namibia, research policies are highly self-reflective, focused on meeting the immediate, local socio-economic challenges facing Namibians. This approach hopes to harness the potential of national research for the sake of making a direct impact on the lives of the country's residents. The policies discussed above lay out the broad parameters of the government's developmental desires, but it is only now starting to establish the research infrastructure necessary to leverage its desires through a national research commission (NCRST) and fund. However, this process has raised many questions, as civil society organisations warn that the Research, Science and Technology Act may end up controlling rather than promoting research outcomes.

At UNAM, research and communication policies have largely followed the government's guidelines, though the university has also creatively translated them for its own academic purposes and increasingly referenced global trends in research and scholarly communication. This was made most clear in the recent ratification of a Scholarly Communications Policy that is based on OA principles. Thus, UNAM's policies are aligned with the government's, but they also go beyond them in important ways, a fact which may grow more important over time if the government's research policies end up controlling, rather than inspiring, greater research production and dissemination.

Chapter 5
Research and communication practices

SCAP's research examines the scholarly communication ecosystem at four Southern African universities in order to address the primary research question: What is the current state of scholarly communication in Southern African universities?

To answer this question, we focused our research on the scholarly communication ecosystems of four faculties at four universities, namely the:

- Faculty of Humanities (FoH) at the University of Botswana (UB)
- Faculty of Commerce (Comm) at the University of Cape Town (UCT)
- Faculty of Science (FoS) at the University of Mauritius (UoM)
- Faculty of Humanities and Social Sciences (FHSS) at the University of Namibia (UNAM)

From an ecosystems perspective, faculties are useful units of analysis for understanding scholarly communication because they reveal the values, norms and practices specific to the relevant discipline while at the same time offering crucial insights into the values, norms and practices of the entire institution. A departmental focus would be too narrow (since most of its practices are structured by quite insular field norms) and an institutional focus would be too broad (since it is shaped by the multiple disciplinary norms within the faculties), but a faculty focus provides the necessary access to both micro and macro fields of operation.

The key virtue of the ecosystem approach for understanding scholarly communication is that it is based on the principle of interconnectivity (Benkler 2006; Cronin 2003; Friedlander 2008; Maron & Smith 2008). Every feature of the ecosystem is connected to every other in a web of mutual responsiveness, a fact that has crucial implications for the analysis of that system, and for any proposed intervention into it. The SCAP team was interested in both of these possibilities.

This chapter compares these four Southern African scholarly communication ecosystems. It does so by assessing the faculties' profiles, temporal obligations, values, research production and dissemination activities, and rewards and incentives. Most of the chapter is concerned with detailing the elements of these ecosystems and how scholars act within them, providing "thick descriptions" of these particular environments. The rich detail that we provide – full of both numerical and textual evidence – allows for important analytical opportunities and lays the foundations for our analyses in the later chapters.

Faculty profiles

UB FoH is comprised of 108 academic staff members, of whom 65 are male and 43 are female (a 60:40 ratio). About 70% hold PhDs while many of the remaining staff are in the process of completing their doctorates while teaching. The majority of these completed their graduate studies abroad at universities in the UK, USA, Canada, Australia and South Africa. The faculty boasts a diverse cohort of members, hailing not only from Botswana, but India, Kenya, Zambia and Nigeria. As Figure 5.1 shows, the FoH academic staff is relatively mature, in that almost all of them are over the age of 40.
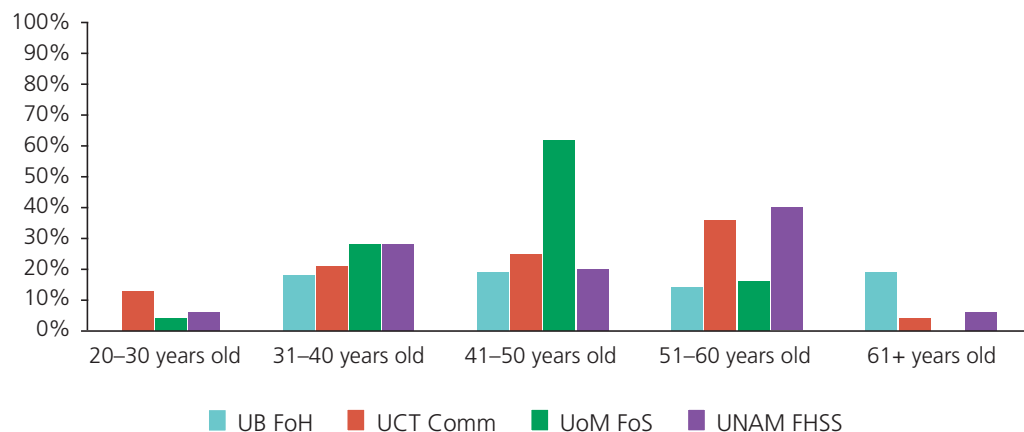
Figure 5.1 Faculty age profile

UCT Comm is comprised of 125 permanent academics, of whom 82 are male and 43 are female (a 2:1 ratio). There are also 56 non-permanent academics (contract staff), of whom 38 are male and 18 are female (also a 2:1 ratio). While many completed their graduate studies in South Africa, a significant number also did their PhDs abroad at universities in the UK, USA, Canada, France, Germany and Italy. The profile of our 28 survey respondents suggests that the faculty staff is comprised of a good mix of ages, as Figure 5.1 shows. Because of this, the faculty should enjoy some demographic stability with the inclusion of "new blood" in the system, but it will have to deal with the impending retirement in the next 10–15 years of a substantial number of mature scholars.

UoM FoS is comprised of 55 permanent academics, of whom 33 are male and 22 are female (a 3:2 ratio). Of them, 47 (85%) hold PhDs and eight hold MScs or MPhils. While a number completed their graduate studies in Mauritius, a significant number also

did their PhDs abroad at universities in France, the UK, Canada, Hong Kong, Australia and India. FoS academics are mostly middle-aged, which suggests that the faculty will enjoy a relatively stable cohort in their "peak years" for a long time.

UNAM FHSS is comprised of 77 academics, of whom 32 (42%) hold PhDs and 36 (47%) hold masters degrees. While a number completed their graduate studies in Namibia, a significant number also did their PhDs abroad at universities in the UK, USA, Netherlands, Russia and South Africa. The faculty is "mature", with many academics in the peak of their careers. However, with more than half of the faculty under the age of 50, it should provide a stable base of scholars in the years to come.

Positions

The four faculties show varying positional profiles that will allow us to understand some of their networking and collaboration choices discussed below. But they also give an idea of how history, size, wealth and mission contribute to staffing structures.
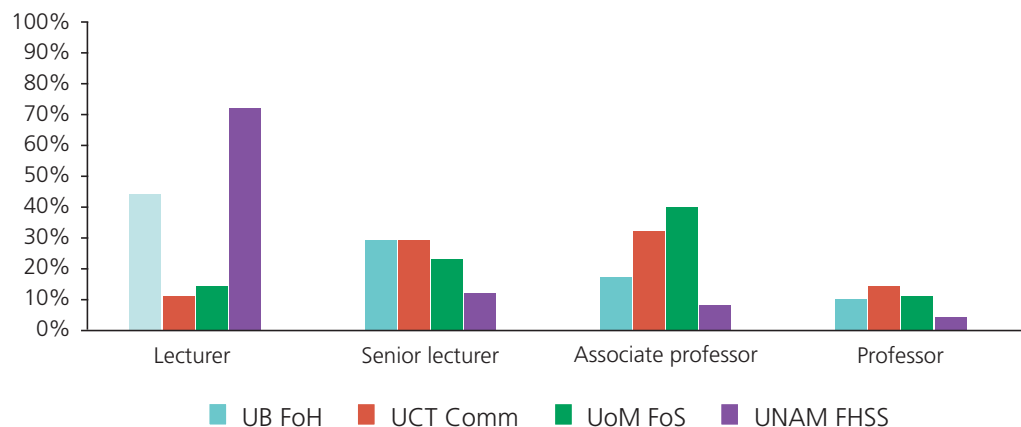
Figure 5.2 Faculty positions/ranks profile

The UB FoH position profile reveals a traditional pyramid structure with a large base of lecturers (44%), a solid layer of senior lecturers (29%), a tapered tier of associate professors (17%) and an apex of full professors (10%). This spread of positions looks healthy and stable for the faculty's development into a research-intensive unit, especially where promotion remains possible for the most productive scholars.

An overwhelming majority of the UCT Comm staff (75%) are either senior lecturers or above, suggesting that the university sees itself as a research, as opposed to teaching, university, since so few remain in the lecturer category.

Over 70% of the UNAM FHSS members are assistant lecturers or lecturers, with only 24% holding the position of senior lecturers or above. This conforms to a pyramid shape of positional hierarchy in which a large base fills "junior" positions (lecturers and assistant lecturers) and supports a gradually tapering cohort of "senior" positions (senior lecturer, associate professor, professor). But it is the sheer size of the lower positional strata that

is noteworthy here: because of the university's strong teaching heritage and its recent merger with the country's former four teacher training colleges, there is a substantial base of teaching-focused staff in the FHSS.

Of the 55 faculty members in the UoM FoS, a full 75% were senior lecturers or above. The largest group were associate professors who comprised 40% of the total. This defies the typical pyramid shape of positional hierarchy in many institutions where the top positions comprise a relatively small proportion of the total. However, unlike the UCT faculty, this is not due to FoS being an intensive research faculty, but rather the result of a history of early promotions when the faculty was established and teaching was a more important criteria for advancement than publication. This has created challenges for younger scholars seeking promotion as the upper ranks are already oversubscribed.

Salary scales

Salary scales at these universities reveal a lot about the amount of funding available for higher education within each national government's budget, as well as how serious the government (and the university) is, or is not, about enticing "international" scholars to work there.

Table 5.1 University salary scales (per annum)[114]

	UB	UCT	UoM	UNAM
Professor	P376,000–P455,000 (USD45,600–55,200)	ZAR771,584 (USD83,425)	(USD38,896)	N$360,816–483,216 (USD36,446–48,810)
Assoc. prof.	P357,000–P410,000 (USD43,300–49,700)	ZAR614,221 (USD66,330)	(USD24,856–32,630)	N$309,456–423,012 (USD31,258–42,728)
Sr lecturer	P295,000–P375,000 (USD35,800–45,500)	ZAR526,873 (USD57,000)	(USD18,447–27,612)	N$268,032–368,688 (USD27,073–37,241)
Lecturer	P196,000–P337,000 (USD23,800–40,800)	ZAR427,311 (USD46,140)	(USD11,609–22,841)	N$224,088–303,936 (USD22,635–30,700)
Assistant lecturer	–	ZAR384,581 (USD41,540)	–	N$193,776–261,756 (USD19,573–26,440)
SDF/JRF	P112,000–P178,000 (USD13,600–21,600)	ZAR384,581 (USD41,540)	–	N$164,076–219,876 (USD16,573–22,210)

At UB, FoH members receive salaries calculated according to position and years of service. The salary scales for the permanent staff (as seen in Table 5.1) appear to serve two purposes. The first is to offer an incentive for financial gain, connecting any raise in position with a raise in salary. The second is to recognise and reward the large cohort of lecturers, many of whom may never move up the ladder. In that category alone, the difference between the lowest- and highest-rung lecturer is P141,000 (USD17,000), divided by 16 intermediate salary grades based on years of service. This means that many staff will spend a long portion of their careers in this position; thus there are many graduated salary levels within this band to recognise their contribution to this category.

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114 Exchange rates used in this study: USD1 = P8.25; USD1 = ZAR9.25; USD 1 = MUR31; USD 1 = N$9,90.

UCT Comm members receive the most competitive salaries of the four universities, in part because South African universities offer some of the best salaries in the Commonwealth when measured according to purchasing power parity (PPP).[115] This suggests that there has been a gradual convergence of salary scales between all of the well-resourced Commonwealth countries due to international competition to attract staff. But the high average salaries in South Africa mask the great diversity of actual salaries paid, as each university operates autonomously in deciding how much to pay its staff.[116] At UCT, Comm faculty are generally pleased with their level of remuneration.

UNAM academic staff are paid relatively competitive salaries, given the teaching-focused nature of the institution. These salaries are also padded by a number of benefits such as a pension, housing allowance, transport allowance, social security, medical aid and a bonus or 13th cheque.

UoM academic staff, on the other hand, are paid quite low salaries, a fact that they noted to us repeatedly. While these salaries are padded by a number of benefits – such as car loan tax breaks, private health care subsidies and paid vacations – their cash value remains far below that of the other three universities. Of course, the cost of living is different in these countries, reducing the direct comparability of these numbers, but they do indicate how "local" or "global" their salary standards are. At UCT, where the administration wants to be able to attract international scholars, the salary scale is set in line with global standards. At UoM, however, which appears happy to employ local scholars only, the salary scale is suited to a relatively immobile academic cohort, one that comes from and will remain in Mauritius.[117] Given the government's desire for the nation to become a regional innovation hub – characterised by high levels of connectivity and collaboration – UoM's low salaries will likely dissuade internationally mobile scholars from joining its ranks.

Time spent on teaching, research and administration

Aside from UCT Comm scholars, the majority of scholars at the other three university faculties said that they spend the majority of their time engaged in teaching-related activities (timetabling, prepping, lecturing, marking, advising, invigilating, etc.). The median indicator from their survey responses is that these activities comprise 55–75% of their time, as Figure 5.3 shows. This is substantial, even if it camouflages the diversity of the self-reported times, as staff members' answers were highly inflected by their positions and interests. But even with this variation, it is clear that teaching remains the major priority at UB, UoM and UNAM, even as they try to become more research-oriented universities. That being said, UCT Comm survey respondents show that they also spend a significant time on teaching activities: close to 50%.

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115 Association of Commonwealth Universities (2011), Executive summary of the ACU Academic Staff Salary Survey (2009–2010), available at: www.acu.ac.uk/focus-areas/staff-salary-executive-summary-2009–10

116 Geoff Maslen (19 December 2010) Australia and South Africa pay top salaries, *University World News*, available at www.universityworldnews.com/article.php?story=20101217224942899

117 According to Kotecha, Wilson-Strydom & Fongwa (2012: 53), in 2009/2010, the UoM and University of Technology Mauritius (UTM) academic staff complements collectively comprised 308 Mauritian nationals and only eight non-nationals (none of which were from SADC).
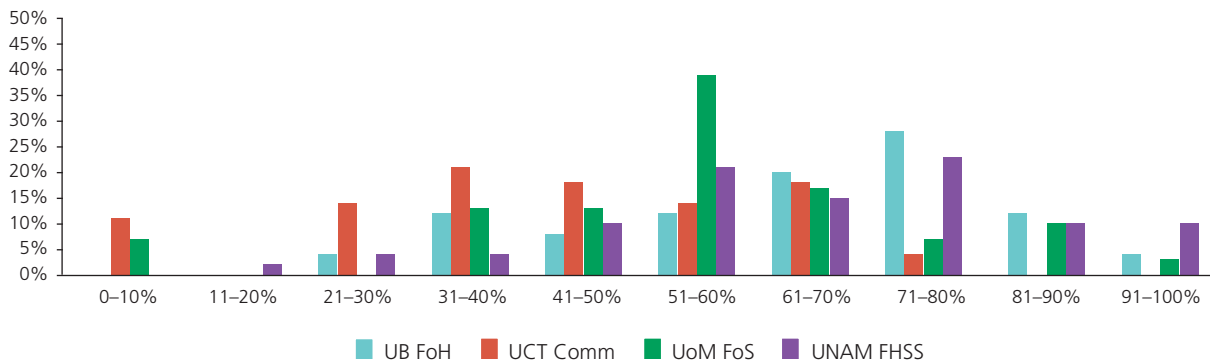
Figure 5.3 Self-reported proportion of time spent on teaching-related activities

The median indicator for the amount of time scholars engage in research-related activities (reading secondary literature, interviewing subjects, carrying out lab experiments, writing articles, etc.) for UB FoH members is 21–30%; for UCT Comm academics it is 41–50%; for UoM FoS members, it is 15–20%; and for UNAM FHSS scholars, it is 15–20%. For all groups, this is lower than they desire, and for all scholars besides those at UCT, it is too low to sustain a robust research culture. The academics at all of these institutions suggest that time is one of the primary challenges in building such a research culture and that, unfortunately, that lack of time is largely due to teaching-related commitments.

Service and administration duties fill the rest of the time that scholars spend in their work life. Most academics complained about this element of their work, saying that it took too much of their time. This was especially true in Mauritius where bureaucratic requirements and capacity deficits placed a large burden on scholars to see to administrative issues that would normally be handled by departmental secretaries (as is the case in the other three universities). However, at UCT, one of the redeeming elements of this administrative work was that a lot of it concerned dealing with research and grant applications and management (rather than just committee work), which at least augmented their research efforts in some way.

Values

To understand scholarly communication practices at the four universities and faculties better, we started by trying to grasp academics' motivations for conducting research and publishing their findings. Essentially, we wanted to know what values underpinned their research and communication activities.[118]

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118 According to Schwartz, all values are defined by the following six qualities: (1) values are beliefs linked to emotion; (2) values are desirable goals motivating action; (3) values transcend specific actions or situations; (4) values serve as standards or criteria; (5) values are ordered by importance relative to one another; (6) The relative importance of multiple values guides action (2012: 3–4). As trans-situational abstract goals that form part of a hierarchically ordered system, values are distinguished from "concepts like norms and attitudes, which usually refer to specific actions, objects, or situations" (Schwartz 2007: 1), and need not be hierarchically ordered. Examples of such values include power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security (Schwartz 1994: 22). In this study, the term 'values' will be used in a slightly more open way, beyond universal abstractions such as benevolence and security, though such deeper values will often underpin the more concrete value expressions noted here in the university context.

This is a foundational question, one that is usually taken for granted in the literature on scholarly communication. Other studies, which usually focus on scholars from the global North, tend to assess academics' attitudes towards research-related issues such as peer review (Harley *et al.* 2007), dissemination outlets (Harley *et al.* 2010; King *et al.* 2006; RIN 2009, 2010; Rowlands & Nicholas 2005), journal quality (Regazzi & Aytac 2008), digital and Web 2.0 technologies (RIN 2010; Rowlands, Nicholas & Huntingdon 2004; Rowlands & Nicholas 2006; Schauder 1993), open access publishing (RIN 2009) and academic identity (Archer 2008).

These valuable studies shed light on scholars' attitudes to elements of their research and communication practices, but they do not get at the more basic question of why the scholars conduct research in the first place. In Africa, where most universities have only recently incorporated a research mission into what have long been teaching-oriented institutions, the question of why scholars conduct research is a pertinent one, and the answers cannot be assumed. Moreover, the purpose of university research on the continent is shaped by more than just the desires of the scholars themselves, but by those of the national government, the institutions' managers, overseas funders, local NGOs, students and community stakeholders. Thus all of these diverse interest groups impact how scholars view the research enterprise.

Based on the numerous interviews, surveys, day-recalls and conversations we carried out at the four universities (as discussed in Chapter 2), SCAP found that the main reasons why these Southern African scholars conducted research were (in no particular order) to:

- achieve satisfaction by acting in accord with personal desires
- aid national/community development
- comply with the institution's mandate to conduct research
- conform to peer expectations by contributing to the research ethos at the university
- earn points towards promotion
- enhance their teaching
- enjoy contributing
- generate new knowledge
- live up to the terms of their scholarly identity
- observe the dictates of their job description
- obtain indirect financial rewards (travel and conference funds)

These motivations would be familiar to scholars at most universities, though the importance accorded to each would be influenced by the contextual factors shaping the institution, such as its history, infrastructure, wealth and mission. Table 5.2 shows how scholars in the four faculties rank those different values (in aggregate) for why they conduct and disseminate research.

While this comparative listing of values (expressed as aggregate preferences, not any particular individual's values) offers a useful snapshot of the kinds of motivations that shape research production in these four faculties, their significance and uniqueness becomes clearer when we analyse and compare them in greater detail.

Table 5.2 Comparison of values: Why scholars conduct and disseminate research (ranked responses)

	UB FoH	UCT Comm	UoM FoS	UNAM FHSS
1	Comply with institutional mandate to conduct research	Conform to peer expectations by contributing to university research ethos	Achieve satisfaction by acting in accordance with personal desires	Generate new knowledge [and] enhance teaching
2	Earn points for promotion	Earn points for promotion	Earn points for promotion	–
3	Enhance their teaching	Generate new knowledge	Generate new knowledge	Earn points for promotion
4	Achieve satisfaction by acting in accordance with personal desires	Achieve satisfaction by acting in accordance with personal desires	Act in accordance with their sense of academic identity	Achieve satisfaction by fulfilling personal desires [and] aid national development
5	Observe the dictates of their job descriptions	Live up to the terms of their scholarly identity	Feel joy through making a contribution [and] obtain indirect financial rewards	–
6	Generate new knowledge	Enjoy contributing	–	Feel joy through making a contribution
7	Aid national/ community development	Comply with institutional mandate	Aid national/community development [and] enhance teaching	Comply with institutional mandate
8	Obtain peer recognition	Obtain indirect financial rewards (travel and conference funds)	–	Obtain indirect financial rewards
9	Obtain indirect financial rewards	Aid national/community development	Observe the dictates of their job descriptions	Observe the dictates of their job descriptions
10	–	Enhance their teaching	–	–
11	–	Observe the dictates of their job descriptions	–	–

In analysing scholarly research values, it is useful to assess the degree to which they are based on intrinsic or extrinsic motivations. A significant psychological literature explicates the virtue of this approach (Kreps 1997; Ryan & Deci 2000; Teo, Lim & Lai 1999; Vallerand *et al.* 1992) and here we will use it to get a nuanced understanding of not only the various scholars' values, but also the institutional cultures that shape them and the research cultures that are produced by them.

To aid our analysis, in Figure 5.4 we have plotted UB FoH scholars' values according to their level of importance for motivating research (*x*-axis) and the degree to which these values arise from intrinsic or extrinsic motivations (*y*-axis). We have then further divided the intrinsic-extrinsic continuum into the three loci of motivation that are most relevant in the university context: the managerial (extrinsic), the collegial/social (mixed extrinsic and intrinsic) and the individual (intrinsic). This trifurcation offers a more precise delineation of scholars' motivation sources at UB FoH.
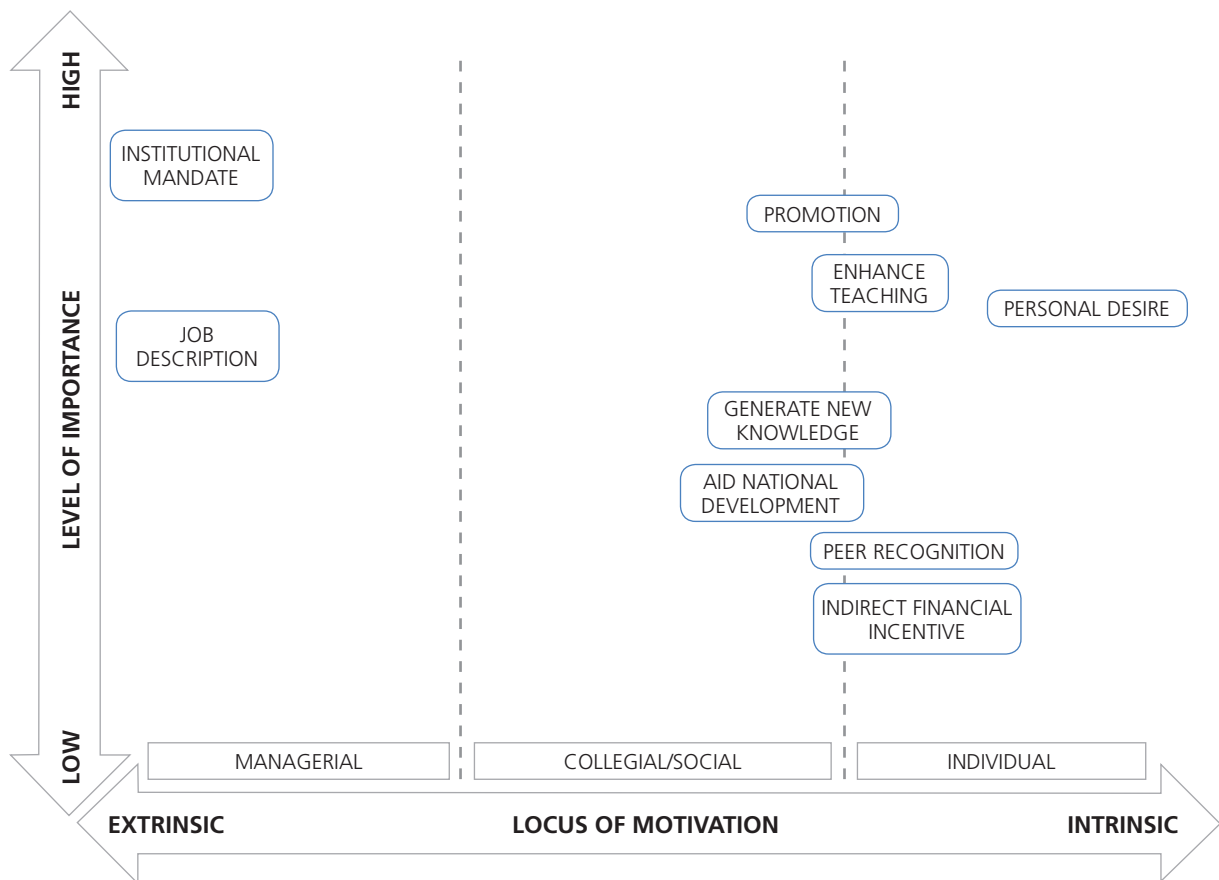
Figure 5.4 Values motivating UB FoH scholars to conduct and disseminate research (aggregated/ranked)

On one end of the continuum, purely extrinsic motivations emanate from the university management. These are the values of the administration that are communicated through formal mechanisms such as institutional mandates (policies) and job descriptions (contracts). When scholars respond to these managerial incentives, their responses can be described as acts of *compliance*, in that their behaviour aligns with external requirements but without any sense of personal buy-in.

On the other end of the continuum, purely intrinsic motivations emanate from within the individual. They express a scholar's idiosyncratic desires, revealed internally as feelings of joy, integrity, virtue and growth. Intrinsically motivated scholars enjoy the research process as an end in itself. When scholars respond to this interior motivation, their responses can be described as acts of *congruence*, in that their behaviour aligns with their own personally held values and desires.

In the middle of this continuum is a space where extrinsic and intrinsic motivations meet; where, in the university context, external collegial and social demands structure internal personal desires. This occurs because the individual scholar identifies with and feels a member of the collegial or social group defining the value. When scholars respond to this motivation, their responses can be described as acts of *conformity*, in that their behaviour aligns internal desires with externally structured values.

Figure 5.4 shows that while UB FoH scholars are motivated to conduct research by both intrinsic and extrinsic factors, the institutional mandate has the greatest overall importance for spurring research production in the faculty.

This motivational structure makes sense for a couple of reasons. First, UB has historically been a teaching-oriented university, thus many of the faculty members (of whom the majority are over the age of 50 in the FoH) developed their sense of academic identity and purpose according to a teaching mission. With the administration's desire for UB to become a research university only formally spelled out in 2008, this new institutional mandate has been a crucial mechanism for encouraging scholars to incorporate research into their work.

Second, as will be discussed later, for a variety of historical, cultural and practical reasons, the management plays an overwhelming role in defining UB's institutional culture. Scholars are comparatively sensitive to the directives given by the administration because they emanate from a source of substantial power. This stands in contrast to the situation at UCT, for instance, where collegial norms (not the administration) comprise the dominant force motivating scholarly research, and at UoM, where scholarly autonomy requires high levels of personal desire (intrinsic motivation) to spur research production. While the institutional mandate is not the only reason why UB FoH scholars conduct research, the fact that it is the top reason reveals how critical the relationship is between the academics and the management, a fact that comes through in virtually every aspect of our discussion on the FoH scholarly communication ecosystem.

At UCT, Commerce scholars are also motivated to conduct research by both intrinsic and extrinsic factors, but the research-oriented ethos of the university has the greatest overall impact, as Figure 5.5 shows.

This institutional ethos is constituted through everyday forms of peer expectation and evaluation between colleagues, often expressed through discursive engagements – such as casual conversation, formal recognition and critical feedback – which put subtle, persistent and yet unmistakable pressure on scholars to evaluate themselves through their research activities. As one manager put it, this is the "currency" that colleagues exchange with each other.

Most of the UCT managers we engaged, who are all accomplished research scholars themselves, recognise this powerful form of peer regulation, both the "carrot" and "stick" elements of it. It is something that the administration supports, though it does not take credit for creating it, nor of maintaining it. It is a social feature of the university. As one manager stated, "there's something about the ethos that people are expected to do research, which is to say that … one isn't a proper academic unless one is publishing … Here it's peer driven as much as management driven."

This ethos also serves to attract other scholars who want to be in such an environment, which further reinforces this dynamic. As another manager said, "UCT has a whole long history of doing research and has a very strong research culture, so it attracts academics
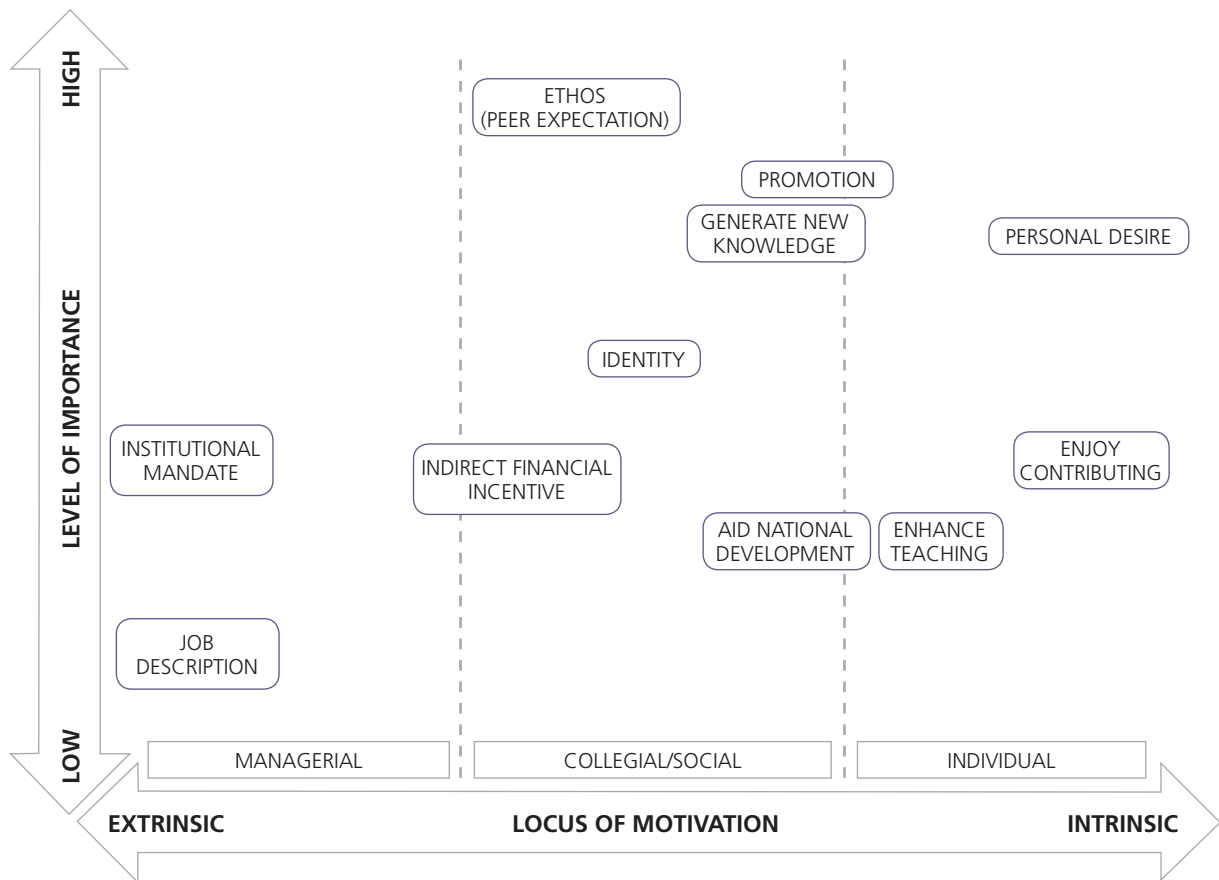
Figure 5.5 Values motivating UCT Comm scholars to conduct and disseminate research (aggregated/ranked)

who are keen on research. And once you're really keen on research, you don't need an extra incentive … It's a research intensive university and encourages people to be here who want to do research and it's got a high standard of output."

This institutional ethos exhibits features of both extrinsic and intrinsic motivation. On one hand, it is extrinsic in that it derives from a broader collegial context which influences the individuals within it. On the other hand, because scholars identify with and claim membership in that collegial society, the values that characterise the group are also reflections of their own individual values. This ethos is shaped by a dialogical, mutually reinforcing process that helps to clarify what values are important for the whole group, and concomitantly, for the individual scholar. Academics do not experience this peer pressure to do research as coming from outside alone, but from within themselves, as they have bought in completely to the collegial norm, helping to maintain it themselves. They have internalised this ethic.

UCT's research-oriented ethos forms an essential part of its broader "research culture" in which every stratum of the institution recognises that the university's core function is to create high-quality published research (not just employable graduates). All of SCAP's interviews with UCT's scholars, librarians and managers revealed this shared outlook.

UoM FoS scholars are motivated to conduct research by both intrinsic and extrinsic factors, but as Figure 5.6 shows, personal desire has the greatest overall importance for spurring research production.

This motivational structure makes sense because, as a teaching-oriented university where the production of research outputs remains secondary to the fulfilment of the teaching mission, the motivation for conducting research often has to come from the individual scholars themselves. If they want to do it, they will be rewarded, but if they do not, they will not be penalised. Thus the choice is theirs to make. Moreover, UoM's highly centralised administrative structure is also relatively weak, permitting a good deal of autonomy to scholars who are allowed to choose whether they want to focus their careers on teaching or research.

However, as we will discuss later, it is difficult to substantiate and sustain a dynamic research culture based on a highly intrinsic motivation system. Personal desire is an important part of any strong research culture, but it is too prone to fluctuations to act as the cornerstone of a deep and abiding research culture. It needs to be balanced by other more extrinsic motivators as well (which UoM currently lacks).
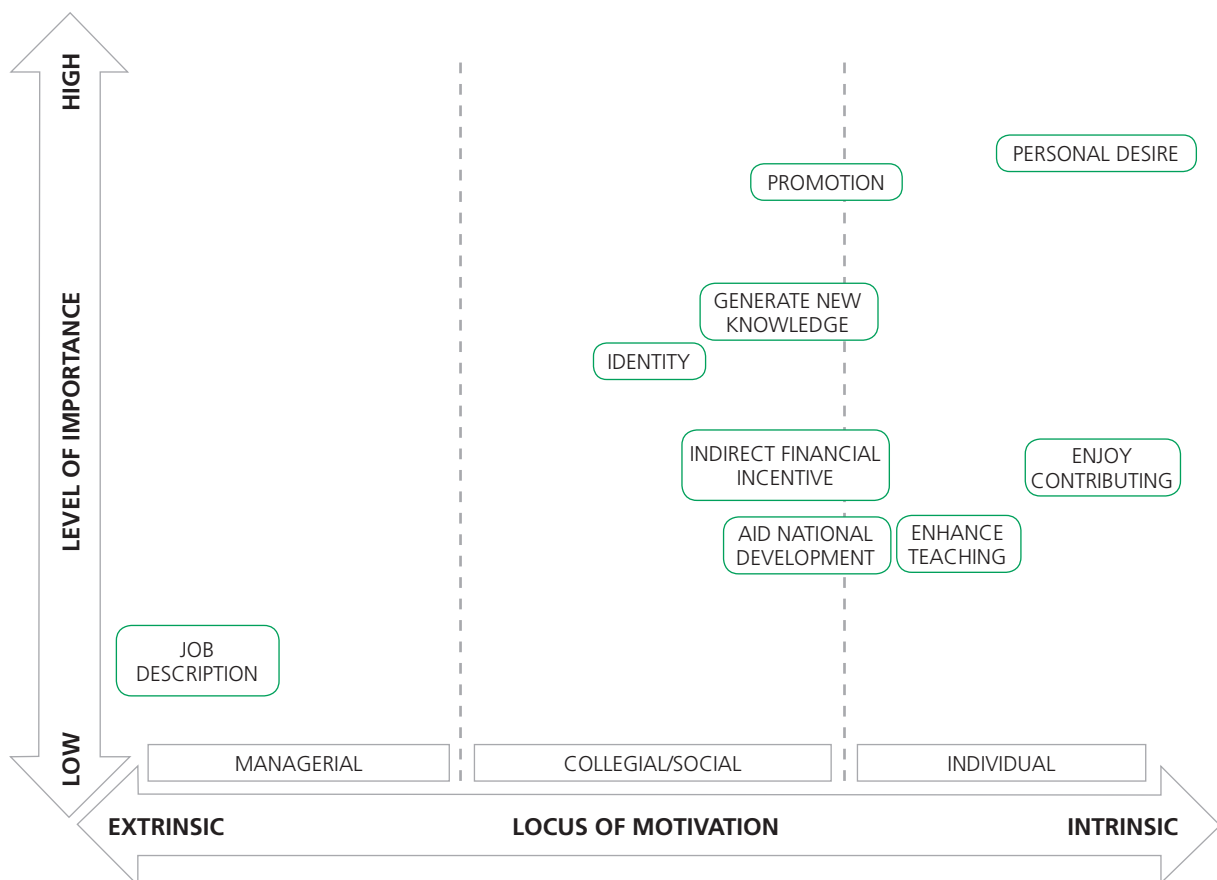
Figure 5.6 Values motivating UoM FoS scholars to conduct and disseminate research (aggregated/ranked)

Lastly, UNAM FHSS scholars are also motivated to conduct research by both intrinsic and extrinsic factors, but the top reasons (tied in terms of importance) for their doing so are to enhance teaching and to generate new knowledge, as Figure 5.7 shows.

As a teaching-oriented institution, research has great utility for UNAM scholars who want to stay current in their field and to learn new ideas through research activity. With a strong teaching heritage – and the heavy teaching loads that scholars face – the primary audience for many of their research ideas is their students, some of whom assist in their research and publication activities. We located this value on the line between social and individual motivation because most of the desire to "enhance" this aspect of their work derives mostly from themselves as individuals, and to a certain extent from their students. Since the administration evaluates teaching performance more according to quantity (hours) than quality, scholars' desire to improve teaching performance emanates largely from themselves, with feedback from their students helping to structure their efforts.

Equally important, many FHSS scholars want to "generate new knowledge" through their research, a relatively intrinsic motivation, but structured by their field of inquiry and the various gaps it contains for a scholar to fill.
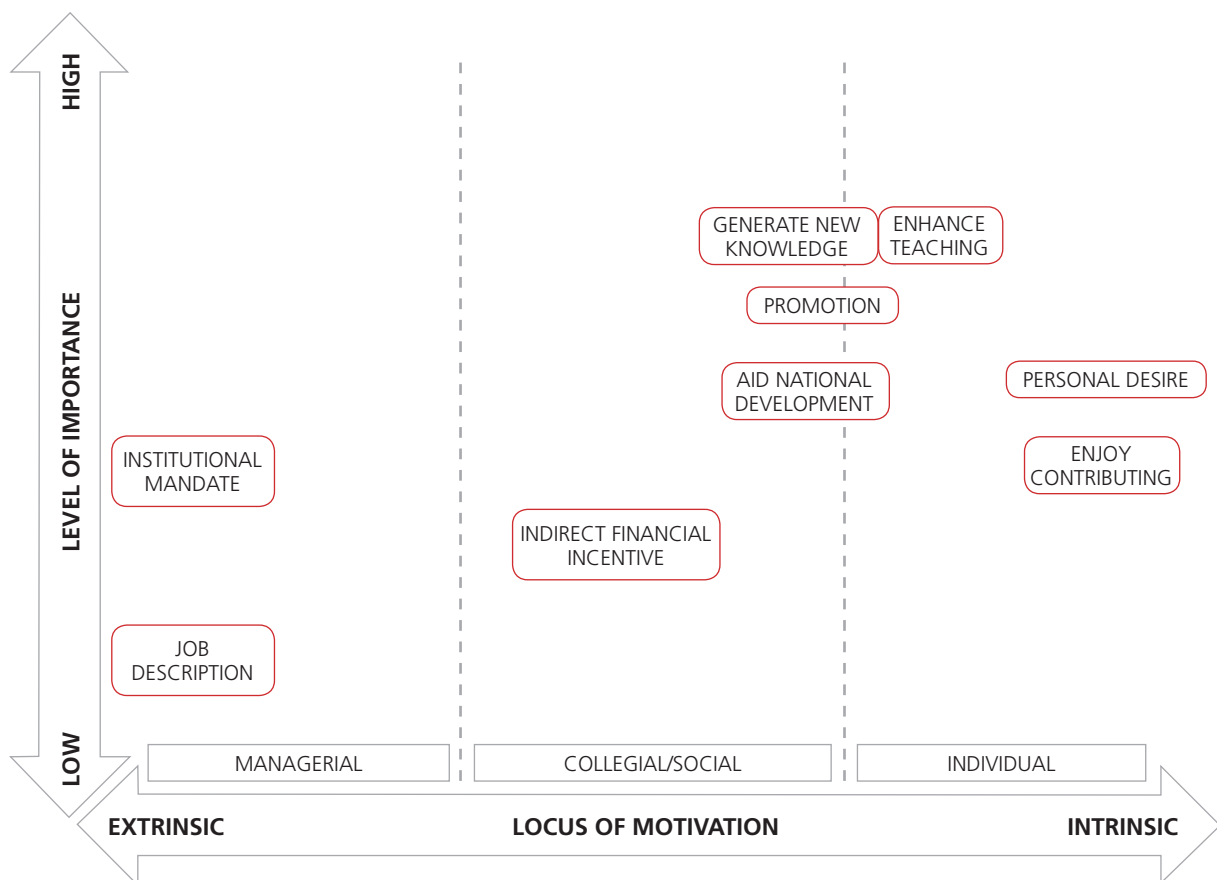
Figure 5.7 Values motivating UNAM FHSS scholars to conduct and disseminate research (aggregated/ranked)

For FHSS scholars, the gaps in national humanities and social science research are massive. They see the country as "virgin territory" for researchers who can explore numerous topics, often producing the first research on a topic in Namibia. They are excited about this fact, that their research can help form the foundation of a truly national scholarly enterprise. As one scholar related, "you want to do that kind of research which can close the gap where other people across the globe can relate to your work." However, it is important to remember that this ranking of motivations is based on an aggregation of the entire faculty's desires. It does not reflect the values of any particular individual who would likely rank their personal desires quite differently. But this analysis allows us to make fruitful cross-faculty and cross-institutional comparisons.

Thus, if we compare the four faculties' research values profiles, it becomes clear how unique they are, as Figure 5.8 shows. At UB FoH, the institutional mandate is the primary research motivator. It is a highly extrinsic managerial value. At UCT Comm, peer expectation predominates, as the production of research is seen as part of the social ethos. It is a mixed, but extrinsically leaning, collegial value. At UNAM FHSS, the desire to generate new knowledge and enhance teaching comprises the two key principles driving research in the still largely teaching-focused university. It is an intrinsically leaning social and individual value. And at UoM FoS, personal desire drives research production. It is a highly intrinsic, individual value.
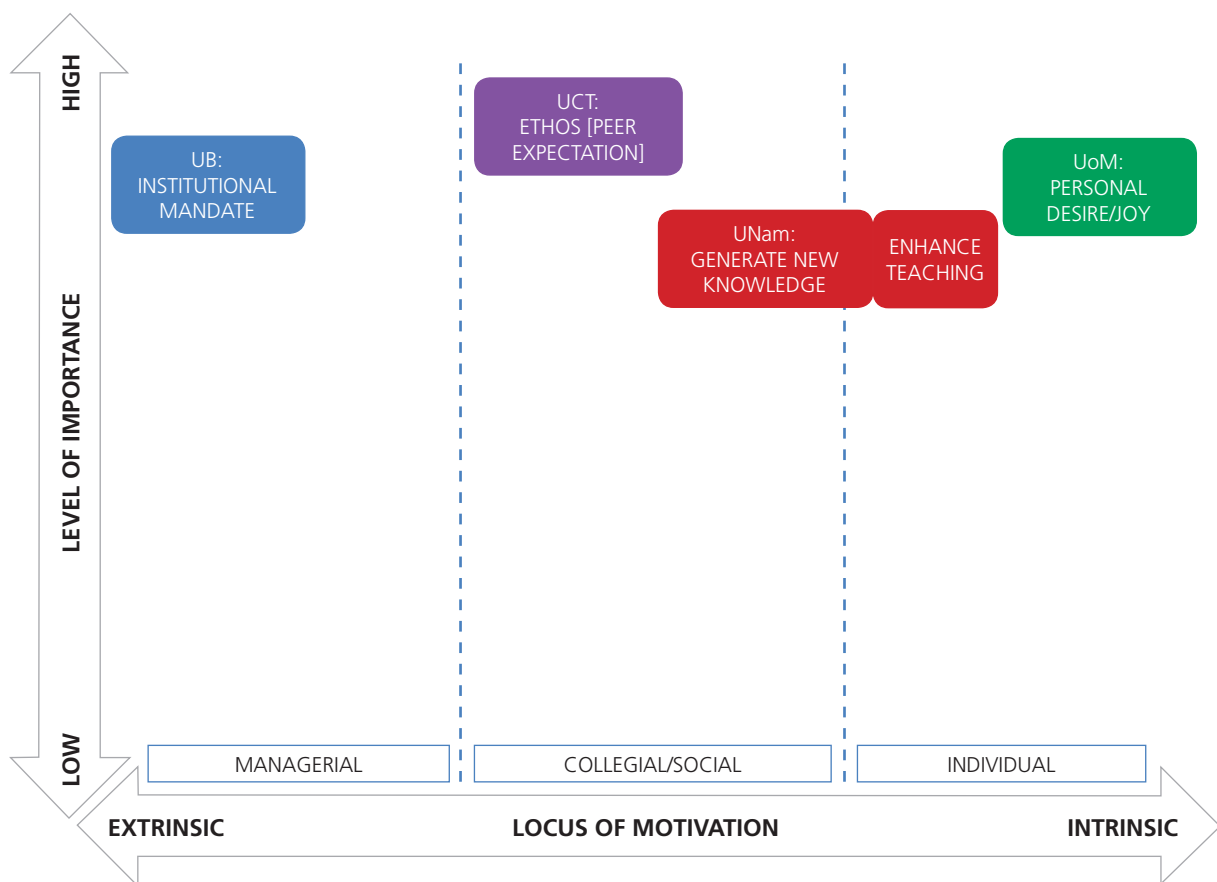
Figure 5.8 Comparison of primary values motivating production and dissemination of research at faculties

This comparison shows that, even though these universities share a number of similarities in terms of geography, history and mission, their differences are sufficient to create significant diversity in how their scholars respond to the question of research motivation.

Open access

As part of our values research, we also tried to gauge academics' feelings about open access principles. In our surveys, we we asked them to indicate their level of agreement with the statement "African scholarship should be freely available on the web." As Table 5.3 show, their responses reveal a mixture of caution and enthusiasm with the prospect of such a reality.

Table 5.3 Survey responses to the statement "African scholarship should be freely available on the web"

	UB FoH	UCT Comm	UoM FoS	UNAM FHSS
Agree strongly	33%	21%	60%	69%
Agree	42%	46%	26%	19%
Disagree	21%	18%	7%	4%
Not sure	4%	14%	7%	8%

At UB, these numbers suggest a solid level of support for open access principles amongst FoH staff members, but they reveal a relatively cautious attitude compared to other universities in the region. That is, most think open access is a good idea, and see the development potential behind it, but others worry about its impact on copyright issues and the rewards and incentive system.

Three issues appear to set the context for the faculty's response to open access. First, most scholars' awareness of open access has come from their engagement with (or evasion of) UBRISA, the university's IR – a point we will discuss more later. Second, many also believe that the country's "open" indigenous knowledge has, in the past, been stolen by outsiders who exploited it for commercial gain without giving due recognition or reward to the people who made that knowledge known in the first place (Kiggundu 2007). Lastly, some FoH scholars lament the losses that digitised open access communication may have on personal scholarly engagements, in that foreign scholars would no longer visit Africa to source materials if they could simply retrieve them on the internet.

UCT Comm scholars share some of these same concerns, but many were simply not convinced that open access was superior to conventional dissemination practices. They noted that there were some circumstances in which publishing restrictions are legitimate (especially if certain commercial considerations are involved) and warned that scholars who make their research publicly available should not be surprised when their work is plagiarised.

A significant percentage of UCT Comm respondents were also outright against open access, stating that it represents a threat to the integrity of research because of increased

spam, piracy, plagiarism and theft of intellectual property. It also poses an unquantifiable risk to journals' stability and financial health, and requires a big investment in time for scholars. Indeed, compared to the other Southern African university faculties SCAP researched, UCT Comm is the only faculty in which respondents were more likely to state that they disagreed with or were unsure about open access than to agree strongly with it.

At UCT Comm, the expression that best captures scholars' thoughts on scholarly communication is "if it isn't broken, why fix it?" Many academics in UCT Comm, of which 40% are over the age of 50, have built careers and reputations on a traditional means of scholarly communication. They have published in subscription-based journals for many years, contributing to their field in a way that has made sense to them. They understand and believe in the virtues of the traditional model of scholarly communication, wary of any new model that might diminish those virtues, especially quality and prestige. Younger scholars often have the same perspective, handed down to them from mentors who have advised them against straying from tried and trusted means of dissemination.

This is an important insight, as it reveals that open access is not a politically neutral dissemination model, nor can it automatically be assumed to be beneficial for all scholars. While it certainly benefits end-users who can download a far greater number of materials for free, it may in fact threaten the power and prestige of scholars who have made their names in the closed system. With open access, they have to learn a whole new way of thinking about how they communicate their research, and they must accept that their work will not only be available to their limited number of journal-subscribing colleagues, but may be consumed by the general public as well. That changes the potential reception of their work, as both scholars and the public contribute to an understanding of its value. Open access also allows for more web-savvy scholars to overcome the limits of the traditional peer-regulated closed model by catering directly to the general public, generating interest in their work based on values held outside of the academy. That is, the OA paradigm opens up collegial power relations in unpredictable ways which may not reinforce the position of those who have thrived under the closed system.

In contrast, UoM FoS scholars revealed a very strong level of support for OA principles. But this support is mainly in the abstract. For the most part, UoM FoS scholars do not go out of their way to ensure that their own publications are disseminated in an OA fashion, nor do they appear to be very familiar with the debates about open access. The primary reason why OA makes sense to them is because scholarly communication within their scientific disciplines has long been shaped, in part, by what we now consider OA principles (such as pre-print file sharing). Within astrophysics, for instance, the arXiv pre-print repository has been a space where scientists share their work, but in an open manner, allowing anyone to download their articles. In health sciences, the PubMed Central site has been shaping scholarly communication norms for many years. Some UoM FoS scholars have published their outputs on such sites.

Thus, as beneficiaries of this open norm within their own fields, UoM FoS scholars see the advantages of this approach. However, since many of these dissemination innovations

were constituted for practical reasons (rather than as part of an open access "movement"), they do not define or circumscribe FoS scholars' own dissemination choices. Rather, when considering where to publish their own materials, they are more interested in the Impact Factor, prestige and appropriateness of the publication than in its open access policies. In their reckoning, if the journal happens to be open access, then that is great; if it is not, then that is also fine. It just so happens that science has been relatively progressive in promoting open scholarship in general, hence FoS scholars' positive attitude about open access assertions and ideals.

However, the term "open access" has come to have negative connotations for some, especially concerning article processing charges (APCs), peer-review deficiencies and plagiarism. Some FoS members have been surprised when, having had a paper accepted by an OA journal, they were then asked to pay an APC (something which the university does not support through its budget). With their low personal salaries, most cannot afford to pay such charges, and thus negatively associate open access with APCs.

This sentiment is further complicated by some who worry about the credibility of anything that is published on the internet, conflating the mass of unfiltered public information on the web with peer-reviewed academic materials, simply because they are disseminated through the same platform. Also, a few scholars who believed that their work had been "stolen" or plagiarised were sceptical of open access, believing that scholars lost their rights to open work. Thus we can describe their perception of open access as mostly positive in sentiment, but uncommitted in practice.

The strongest levels of support for the open access statement above came from the UNAM FHSS scholars who, like the Mauritians, have also not done much to substantiate their sentiments with any concrete actions of their own. However, this makes sense in an environment where the level of research production is relatively low and the platforms for disseminating that research locally are minimal (and not open access themselves). FHSS academics understand how open access would greatly benefit their own research efforts – allowing them to access materials freely from the internet – and increase the visibility of their own research; but in an ad hoc research environment, scholars are more apt to take advantage of whatever communication channels are available to them (such as the faculty's own journal), regardless of whether it is open access. For the moment, their actions suggest that it is impractical to insist on communicating their own work in an OA fashion, though it is their preference.

These varying responses from the four faculties show the practical, moral, technical and financial challenges involved in embedding OA commitments from the ground up. Scholars reveal a variety of perspectives on the mattter and will all have their own reasons for engaging or not engaging with open access. Indeed, as the Mauritian example shows, open access flourishes more when it is constituted as a discplinary norm that shapes whole fields of activity than as a moralised choice made by individuals. It has a chance of becoming more acceptable in environments where the scholars and the administration are in agreement about it (as at UNAM) and move forwards with an institutional approach to OA communication (as has recently happened, discussed in Chapter 4).

Research and dissemination cycle

Having established the faculties' demographics, their motivations for conducting research and their feelings regarding open access, we can now explore the scholars' research production and dissemination practices. To help us to understand them, we consulted a number of other scholarly communication models (Björk 2007; Garvey & Griffith 1972; Houghton, Steele & Henty 2009; Hurd 2000; Sondergaard, Andersen & Hjorland 2003; UNISIST 1971), many of which had been theorised prior to the revolution in online digital communication, the mainstreaming of OA ethics and the proliferation of Web 2.0 technologies. But due to the fact that global scholarly communication norms have been evolving so rapidly over the last few years, we decided to utilise Czerniewicz's (2013) research and communication cycle model because it incorporated an understanding of these important developments.

Czerniewicz (2013) compares the "traditional" (closed, scholar-to-scholar) research cycle to the digitally mediated, open access model that is shaping the current global scholarly communication landscape. Both are based on the same four core elements – conceptualisation, data collection and analysis, articulation of findings, and translation and engagement – and both include similar types of intellectual inputs (literature reviews, conceptual frameworks, etc.) and research outputs (books, journal articles, etc.). But the key difference is that, in the new model, scholars are able to communicate elements of their research during every step of the research cycle through various digital platforms, from the conception phase onwards. They no longer have to wait until every facet of the project has been completed before they start sharing thoughts, processes and findings through various online mechanisms (such as blog posts, tweets, comments).

The key virtue of the Czerniewicz model (Figures 5.9 and 5.10) is that it views scholarly research as occurring along a cyclical, rather than a linear, path, as so much of scholarly work involves retracing one's own steps through prior research data. Scholars revisit their materials and spin off new outputs, travelling around the research and dissemination cycle multiple times before moving to new projects and cycles. It also has the virtue of presenting contemporary dissemination activity as "radiant", pushing scholarly objects outwards towards multiple audiences (scholars, students, industry, civil society) at each point along the cycle. This updated understanding of the research and dissemination cycle allows us to assess the four faculties' activities from a unique vantage point.

Conceptualisation

During the first step of the research and communication cycle, scholars conceptualise the issue that they will explore through their proposed research. This process entails not only serious intellectual work (thinking through the various aspects of a potential research project and imagining possible processes, problems and outcomes) but also important planning work (assuring that the plan is feasible and worthwhile from a theoretical, practical and financial point of view).

Individual
Private
Shareable by request only

Celarly demarcated,
unidimensional audiences

Student

Proposals
Literature reviews
Conceptual frameworks
Bibliographies

Conceptualisation

Expensive textbooks
Online resource access
limited to course students only

Not shareable
Possibly not digitised

Translation
Engagement

Data collection
Data analysis

Notes
Lectures
Presentations
Reports
Interviews

Recorded interviews
Datasets
Images
Audio records

Community

Findings

Books
Journal articles
Conference papers
Technical papers

Scholar

Stable, text-based,
"authoritative" versions

Figure 5.9 Traditional research and communication cycle (Czerniewicz 2013: CC-BY-SA)

Open processes
Increased visibility
Increased collaboration
Earlier access

Shared and shareable
e.g. social bookmarking, protocols,
proposals

Proposals
Literature reviews
Conceptual frameworks
Bibliographies

New modes
visual and audio lectures
New genres
e-books, open education resources

Conceptualisation

Data linked, curated, shareable
Metadata
Multiple modes

Translation
Engagement

Data collection
Data analysis

Notes
Lectures
Presentations
Reports
Interviews

Recorded interviews
Datasets
Images
Audio records

New measures of impact
use, downloads, citations, etc.

Findings

Dynamic multimodal versions
The rise of rich media

Books
Journal articles
Conference papers
Technical papers

The "enhanced publication"
multimodal, hyperlinked
Mainstreaming of
open access outputs
Emergence of the
"megajournal"
New modes

Changing audiences
(e.g. lifelong learners, global reach)
Two-way process
(e.g. citizen science)
Access to all types of resources

Figure 5.10 New research and communication cycle (Czerniewicz 2013: CC-BY-SA)

Part of the intellectual process involves engaging with the relevant secondary literature to establish whether a new project would have analytical value and make a contribution to the field. Such engagement not only ensures that one's research does not duplicate previous research, but it is generative of new ideas in itself, usually offering new dimensions to a research concept.

The planning process not only involves determining where the research should take place (lab, in the field, etc.) and who should be invited to collaborate in the process, but also involves determining how much funding is required to conduct the research and which funders should be engaged to obtain the funding (if necessary).

For the purposes of this discussion, we focus less on the creative processes with which the faculties' scholars engage during their conceptualisation activities and more on the practical elements of their research and communication practices. These relate to scholars' use of print and electronic materials, their online search behaviour and their utilisation of various funding opportunities.

Print and electronic materials usage

To understand the types of scholarly materials that scholars engaged during the conceptualisation process, we explored their usage of print and digital materials. What became immediately apparent was that they continued to rely on both. When asked to rate the importance of certain *print* materials to their research, they rated international journal articles as the most important, followed by nationally produced journal articles, books and conference papers, but in an order that makes sense of their disciplinary practices and institutional resources.

The bias towards international print sources is probably best explained through demographics and relative levels of production: the amount of "international" scholarship available is enormous compared to the relatively smaller amounts of "national" scholarship available from Southern African countries. Though most of the national literature will be highly relevant for local issues, it won't be of greater volume than the cumulative amount of materials generated elsewhere that are also relevant. (Some scholars also suggest that the "international" category is more prestigious than the local, national one, which may also raise those materials' sense of importance, though this is not likely to be the decisive factor when it comes to uptake.)

Table 5.4 Most important print materials (aggregated/ranked)

UB FoH	UCT Comm	UoM FoS	UNAM FHSS
Journal articles (international)	Journal articles (international)	Journal articles (international)	Journal articles (international)
Books (international)	Journal articles (national)	Books (international)	Journal articles (national)
Journal articles (national)	Books (international)	Conference papers	Books (international)
Books (national)	Books (national)	Journal articles (national)	Books (national)
Conference papers	Conference papers	Pre-prints	Conference papers

But the relatively high ranking of national journal articles for UNAM FHSS scholars shows how important the development of their own in-house journal has been for them, certainly compared to UoM FoS scholars who do not access locally produced science journals.

This pattern of international bias is replicated for digital online content as well. However, some of the academics (especially in Mauritius) indicated that they faced difficulties accessing journal articles due to some of the universities' limited journal subscription packages. To deal with this, many activated their international networks and simply asked their overseas colleagues to download the desired articles for them. Such "illegal" behaviour is not officially sanctioned, of course, but it shows how scholars located in resource-scarce environments cope with their relative deprivation: they access their networks abroad for assistance.

Search behaviour

When searching for materials online, UCT Comm said that they use Google Scholar the most (72% "often") followed closely by academic databases (71%). This pattern is reversed at the other Southern African universities where there is a clear preference for the databases over Google Scholar.

Table 5.5 Online sources consulted "often" for academic materials

	UB FoH	**UCT Comm**	**UoM FoS**	**UNAM FHSS**
Academic databases	84%	71%	74%	72%
Google Scholar	62%	72%	43%	54%

This is likely due to the fact that the other universities have highly limited journal subscriptions, making it not worth their time to look through Google Scholar where so many of the results will be unavailable to download. So, they stick with their databases where they are assured of being able to download the material.

Funding sources

During the conceptualisation phase, scholars must consider seeking funding for their new projects. Whether they obtain it, and from whom, has a significant impact on how they end up conceiving of their research, how they conduct it and how they disseminate their findings.

According to our survey respondents, the majority of their recent research projects were either funded by their universities, unfunded, or funded by international NGOs, their national governments, overseas universities or foreign governments. The rest were typically funded through international research networks or the private sector (Figure 5.11). While these responses tell us nothing about the financial value of these funded projects, they give an indication of the diversity of sources from which scholars draw for their research.
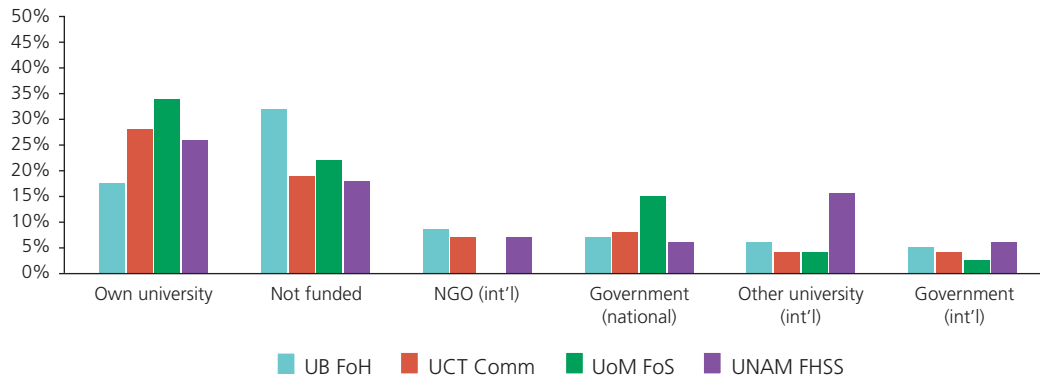
Figure 5.11 Top funding sources for respondents' research projects over the past two years

At UB, it is not surprising that many of the Humanities scholars' projects are "unfunded", not because UB is particularly resource-poor, but because a lot of research within this discipline can be achieved without outside funds.

Furthermore, in cases where the amount of money necessary to conduct research is small, many UB FoH scholars say that they pay these expenses out of their own pockets rather than spend their time dealing with all the of the paperwork required to get the funds from the university.

Though the predominance of unfunded and university funded research suggests that FoH scholars operate within certain funding constraints, the "long tail" of other funding sources that scholars tap into (especially from NGOs) suggests that some of them enjoy a healthy connection to regional and international funding sources.

At UCT, the majority (55%) of Comm scholars' projects were either funded by the university (28%), unfunded (19%) or funded by the government (8%). But similar to the other universities where scholars have to look beyond their own universities for research funding support, UCT Comm scholars also source a good deal of support from external bodies, suggesting that they enjoy the prestige and networks necessary for broad research opportunities. One of the ways in which they do this is by acting as the "African partner" in a larger, Northern-funded project that requires input from a number of global research collaborators who can provide and analyse local data for it. Another way in which Comm scholars get further research funding is through consultancy work. According to one manager, "people have to be very creative in sourcing funding for their research and really, the only way to get big ticket, expensive research done, is to find ways of combining contract work with research."

At UoM, the majority of projects in which the FoS respondents participated over the last two years were funded by the university (34%), not funded (22%), funded by the national government (15%) or funded by international research networks (12%). The role of other international universities, foreign governments and the local and international private sector was comparatively smaller (each less than 5%). These results

suggest that the university provides an important base of support for FoS research activity. Though many academics complain about the bureaucratic procedures involved in accessing these funds, they acknowledge that the university's research fund remains the first choice for many of their projects, especially if they are conceived and run at the university.

The government is also a significant source of support for FoS research, through the Mauritius Research Council (MRC), the Tertiary Education Council (TEC) and the Ministry of Tertiary Education, Science, Research and Technology (MTESRT). All of these combine to create a relatively robust national research infrastructure.

At UNAM, the majority of projects in which FHSS respondents participated over the last two years were funded by the university (26%), not funded (21%), funded by other international universities (18%) or funded by international NGOs (7%). This shows that the university provides a solid base of support for FHSS research activity. Though some complain that the university does not have enough for large research projects, they acknowledge that the university's research fund remains the first choice for many of their projects. A number of academics also sourced funds for applied projects through consultancy research, many of which were "development-orientated". And the solid percentage of projects funded by international universities shows the growing interest that the global academic community has in partering with UNAM scholars.

While these percentages reveal an interesting picture of funding opportunities and trends, they do not say anything about actual funding levels, nor do they reveal whether scholars are satisfied with their own opportunities. In most cases – with UCT Comm respondents being the exception – scholars complained that the money available for them to carry out their research was too limited.

Data collection and analysis

The second phase of the research and communication cycle entails data collection and analysis. It also opens up opportunities for sharing preliminary findings and data publicly, prior to formal publication. For some scholars, this might involve conducting interviews or surveys, carrying out sample studies and examining archival materials, while for others it would mean conducting experiments in the laboratory or collecting materials in the field. In all cases, it would also entail some level of engagement with tools and technologies that help to process that data into results that can be analysed.

For the purposes of this discussion, we focus less on the research processes that these scholars engage in during their data collection activities and more on the tools and technologies that mediate them. Within our ecosystem framework, tools form a crucial node in the scholars' research and communication activity system. Tools also comprise the element in this phase that determines the level of research at which scholars can engage. We will also discuss whether Southern African scholars utilise this time to share research information prior to publication or whether they prefer to withhold such knowledge until after it has been formally vetted.

Tools and technologies

Unlike their colleagues in the sciences, UB FoH scholars do not require much specialised technology beyond what the university normally provides to conduct their research. For the most part, they can make do with computers, broadband internet, scanners, photocopiers, digital recorders, etc. However, this does not mean that they do not still face technological challenges. For instance, UB computers are connected to what scholars complain is a slow internet connection, hampering research efforts and debilitating any type of activity involving rapid uploading and downloading. Most indicated that they could not download articles at home. They also faced the disruptive reality of random power outages, a fact that can devastate electrical machines, wipe out data and create a general sense of uncertainty about the value of committing to a particular computer-based research activity.

UCT is well-provisioned in terms of mechanical technology, but this has not always been geared towards scholarly communication. For instance, UCT does not yet have a fully functional IR, due in part to the fact that UCT scholars are already relatively visible through their publication in high-prestige journals, to which they have left the task of curating and profiling their work. Though this means that their work is dispersed across a range of commercial journal sites, UCT scholars and librarians have been slow to move to the IR concept. A handful of departments, faculties and units have done so on a smaller scale, though. Recently, however, UCT's management has started looking into the prospect of investing in a proper IR as well.

UoM FoS academics require heavy investments in equipment to be able to do their research. Many say that while they enjoy decent access to equipment on campus (or on the island), they are limited when it comes to very expensive or new equipment. To carry out research that requires highly sophisticated technologies beyond the university or country, they must tap into international scientific networks, outsourcing elements of their data collection. This is not an unusual arrangement in the scientific community, but it adds another layer of complexity and time to local research projects. It was one of the more common complaints by FoS scholars, that they desired more laboratory and specialised equipment for carrying out original, cutting-edge experiments.

Similar to their UB counterparts, UNAM FHSS scholars do not require much specialised technology beyond what the university normally provides to conduct their research. While UNAM is relatively well provisioned in terms of mechanical technology, it is only now developing the tools that could optimise scholarly communication, such as a (fully functioning) IR and a scholarly e-portfolio platform. These will become valuable for raising the visibility of UNAM research, especially once the new Scholarly Communications Policy is implemented.

The key point here is that tools and technology make up only one element of a scholarly communication ecosystem, thus managers and funders often make the mistake of thinking that they can improve a situation by simply inserting a new technology into it. That is often not the case, especially if the supporting community lacks the capacity to use or run it, or if it is not integrated into a strategic framework or institutional policy commitment. Tools and technology must always be understood in their broader context.

Circulation prior to publication

To understand every element of scholars' behaviour in the research and dissemination cycle, we asked them whether they ever shared their research drafts, pre-prints, working papers, or datasets prior to publication, and if so, with whom.

Table 5.6 Responses to the question "Do you circulate your research prior to publication"?

	UB FoH	UCT Comm	UoM FoS	UNAM FHSS
Yes ("often" or "sometimes")	64%	75%	80%	66%
No ("never")	36%	25%	20%	34%

The results showed that, at UB, almost two-thirds of FoH respondents said that they "sometimes" or "often" circulated their work prior to publication, mostly by incorporating it into their teaching. They also, with less frequency, shared such pre-publications with their immediate project team members, colleagues at the university and wider academic network. Almost none circulated these materials to the general public or the government (67% "never").

At UCT, most Comm scholars shared their work with team members and colleagues, especially since they keenly desire critical feedback from their peers and since there are a lot of seminar fora for doing so. The social ethos of the institution reinforces scholars' desire to share and engage with each other. However, they do not generally share their work prior to publication with the general public or with the government. This could be because they prefer that only their formally published research reaches these audiences, or that these audiences are not targets of their dissemination plans. From our conversations with them, it appears to be a combination of the two. First, there is no formal incentive for sharing such non-published research with these audiences, and second, scholars tend to trust that, if their work is useful in social or governmental settings, it will be recognised and taken up by these audiences at some point during the long scholarly communication feedback loop.

At UoM, FoS scholars tend to share their work with team members and with students. Both groups are often co-contributors to research projects, and they are keen for their students to be involved in various experiments as well. FoS academics tend not to share their work with their colleagues, however, since there is not only a lack of regular fora for doing so, but because their colleagues are not likely to have a specialised knowledge of their specific field, thereby diminishing the utility of their feedback. Thus they prefer to share such unpublished work at international conferences amongst fellow experts. (They also rarely share with the public or the government, though if they receive money from the MRC, they are often encouraged to give feedback to the council on their findings.)

At UNAM, many seminar series have faltered in the past due to scholars' heavy teaching commitments, thus they tend to wait to present their work at conferences. They also share their work with students and project team members, but not with the public or the government. This suggests that FHSS scholars circulate their work in a functional and

narrow sense, either to the limited members of their project group, or to the students with whom they interact multiple times per week in class. This is not an image of "the globally networked scholar" who circulates drafts widely to broad audiences, but more the "personally networked scholar" who shares with those who matter for the project, or who happen to share time with him/her on a regular basis.

Articulation of findings

The third phase of the research and communication cycle entails scholars' presentation of findings to other scholars. This usually involves the writing and publication of peer-reviewed journal articles, book chapters, books and conference papers (an output type that can straddle the pre- and post-publication line). It is the time when scholars share their research findings with their peers through formal communication mechanisms. For many scholars – and university reward and incentive structures – it marks the imagined culmination of the scholarly research and dissemination process because academics are assessed by colleagues and managers (for promotion) according to the quantity and quality of these outputs.

For the purposes of this discussion, we focus less on the constitution of those findings or the various "impacts" that they may have had on their respective fields and more on the output types that they produce, their online dissemination activities and the composition of their research and dissemination networks. These are crucial elements in the third phase of the cycle.

Output types

We asked scholars to identify the various outputs that they had produced over the previous two years. We offered a checklist of possible output types that allowed us then to compare the various activity preferences of the scholars. We also noted whether the outputs were produced by scholars as "sole authors" or as "co-authors". The data and figures below need to be understood with the recognition that every scholar has a slightly different interpretation of what an "output" means, though we tried to keep it as simple as possible for them. Also, our use of the term "two years" cannot be taken to mean a literal 24-month period prior to the date on which they filled out our surveys, as scholars were free to cast their minds back over a vaguely constituted "two-year" period to answer the question. However, the purpose and value of this data is to give general indications of how scholars produce outputs in their respective scholarly communication ecosystems. To that end, this data is quite useful.

At UB, the research outputs generated by the FoH scholars are quite diverse. This is because UB's promotion criteria include significant weighting for scholar-to-government and scholar-to-community outputs, not just scholar-to-scholar outputs (which is often the norm elsewhere). UB scholars have a real incentive to publish these alternative outputs. They are also encouraged to publish in national, regional and international journals and books, a fact reflected in their activities.

Of the 183 outputs that our UB FoH survey respondents reported producing over the past two years, 148 of them were sole-authored and 35 were co-authored collaborative

pieces (a 4:1 ratio). This is a typical production ratio for a humanities faculty, based on disciplinary norms of solitary research and analysis. But depending on whether an output was produced alone or in collaboration, different and revealing patterns emerge.

For sole-authored outputs, the highest proportion of scholars worked on or produced national conference papers (70%), followed by international journal articles (59%), international conference papers (56%), book chapters (44%) and national journal articles (41%). This suggests that there are relatively good opportunities for presenting work locally and that these are ideal fora for scholars to present drafts of their work.[119] However, the relative dearth of locally produced journals also explains why scholars publish a higher proportion of their journal articles internationally than nationally.

For co-authored outputs, grey literature is the most produced output (41%), followed by national journal articles and book chapters (29% each). International items are significantly fewer: international conference papers (from 70% sole-authored down to only 3% co-authored) and international journal articles (59% sole- to 9% co-). This suggests that the UB FoH scholars are more likely to collaborate on reports for local consumption, such as consultancies, because of the increased generation of grey literature, which went from 5% sole-authored to 41% co-authored.

It also suggests that faculty and disciplinary norms support individual production over collaborative production. This is made clear not only in the 4:1 ratio just discussed, but in the focus of those different efforts. Thus, when FoH scholars produce sole-authored outputs, they tend to be in genres that carry weight in promotion assessments. But when they produce co-authored outputs, they tend to be in genres that carry less weight for assessment purposes (such as reports), but which might entail greater financial reward (from an external consultancy) and the need for greater capacity.

Ironically, this diversity of outputs provides an insight into why UB FoH scholars' work is relatively invisible according to the major academic productivity indices (such as the Thomson Reuters Web of Science index). Indeed, of the outputs listed in Figure 5.12, only a few per cent of them – listed in the second column marked "Journal articles (int'l)" – will be rendered visible by the major indices.[120]

Due to FoH scholars' temporal and financial constraints, they find it difficult to conduct fresh, empirical research projects. Rather, after they complete their PhDs, they continue revisiting that research for many years, spinning off presentations and publications related

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119 This is true of conferences organised at the faculty or institutional level, but not necessarily of seminar series organised through the various departments.

120 A number of African scholars see this diversity of outputs as a negative development, proof of the diversion of African academics' talent away from their core mission (which would include writing peer-reviewed journal articles rather than reports for aid NGOs). Mkandawire (2011: 19) says that "the aid establishment today commands much of the intellectual resources devoted to development through its own research agenda, through the consultancy industry and through its selective support of research programmes and epistemic communities in developing countries. The reward system that the aid establishment dominates favours the report over the peer reviewed journal paper. Many academics inside and outside have been drawn into this system as they move freely through the revolving door linking academia, the consultancy industry, philanthropic organisations and international financial institutions. In the process, institutions of learning have, as in the colonial period, been harnessed to the task of remote management of the African continent."

to it. They then start to supervise and build a group of students around them, with whom they are occasionally able to publish. Some apply for university funding to embark on new projects or further areas related to their PhDs. Many, however – perhaps because they do not have wider scholarly networks or because the teaching and administration loads are simply too high – never raise research funds. This means that the proportion of projects involving empirical work remains low (excluding those related to PhDs or consultancies). In fact, because it is difficult to get large pools of funding to run their own big research projects, FoH scholars often seek out international collaborators (especially from the global North, or South Africa) who can resource the necessary funds.

Figure 5.12 UB FoH research production over two years, by % of respondents producing these outputs

At UCT, of the 158 outputs that our Comm survey respondents reported producing over the previous two years, 77 of them were sole-authored and 81 were co-authored collaborative pieces (basically a 1:1 ratio).
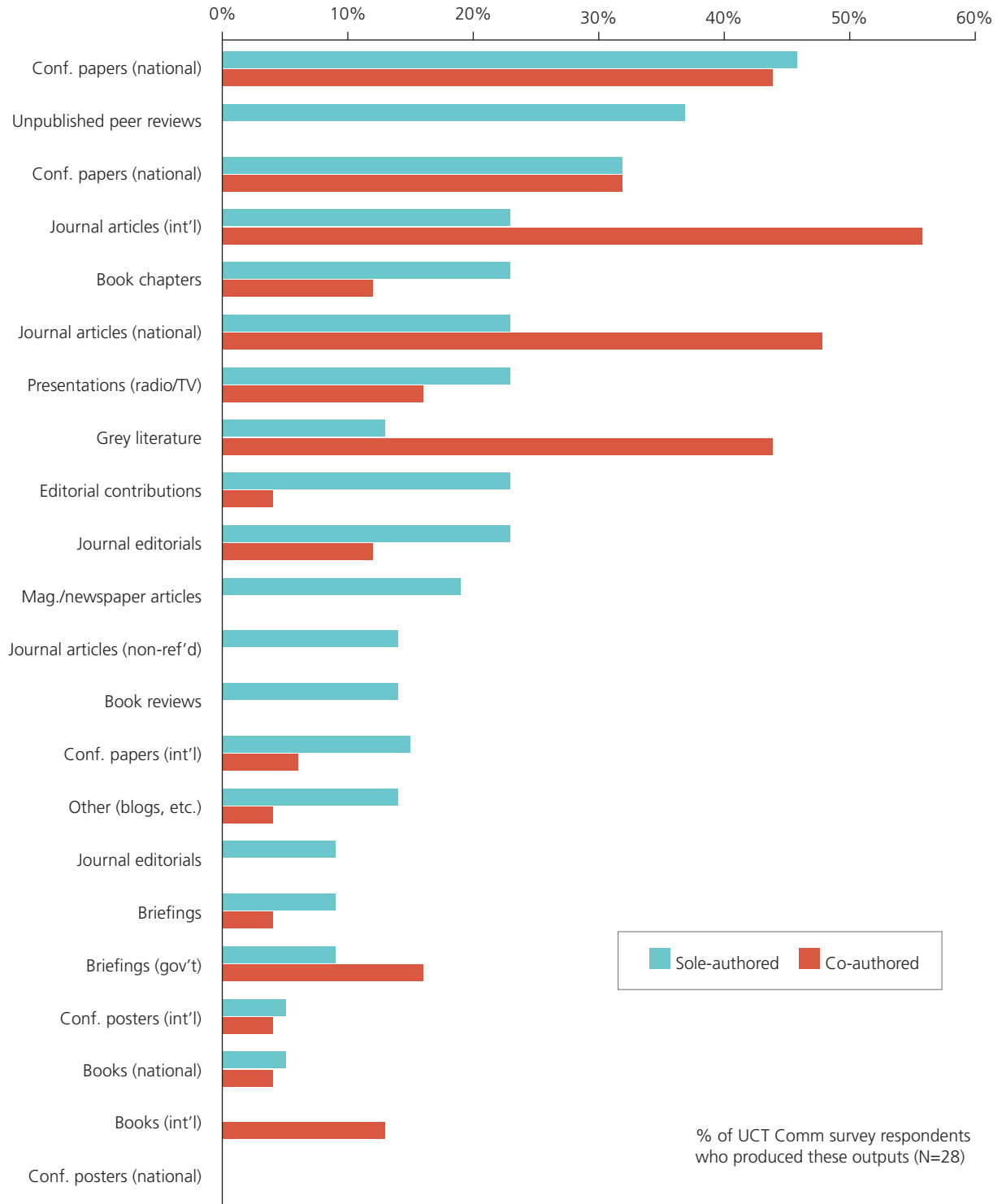
Figure 5.13 UCT Comm research production over two years, by % of respondents producing these outputs

This is very different to the high sole-authored proportions from UB's FoH (4:1) and UNAM's FHSS (3:1), and the high co-authored bias from UoM's FoS (1:4).

For sole-authored outputs, Figure 5.13 shows that the highest proportion of scholars worked on international conference papers (46%), followed by unpublished peer reviews (37%), national conference papers (32%), and then seven categories of output at 23% each: book chapters, grey literature, international journal articles, national journal articles, magazine/newspaper articles, radio/TV presentations and contributions as editorial members. This suggests that scholars are involved in many different elements of production and dissemination, especially noteworthy being their contribution to journal editing duties and translating their work for popular audiences.

For co-authored outputs, the majority of respondents produced international journal articles (56%), followed by national journal articles (48%), international conference papers (44%), grey literature (44%) and national conference papers (32%). This confirms the words of a manager who stated that "the faculty publishes four or five books a year, but articles are the overwhelming focus, in journals."

This suggests that UCT Comm academics have certain publishing and dissemination strategies depending on whether they work on an output alone or with others. For instance, most of their service work (unpublished peer reviews and editorial efforts) and scholar-to-community outputs (magazine/newspaper articles, blog posts, etc.) are sole-authored while much of their collaborative work leads to scholar-to-scholar outputs, such as journal articles. There is a good deal of overlap in what they produce alone and in collaboration, but these variations suggest that collaborative work typically leads to scholar-to-scholar communications (or grey literature, if it is a consultancy report for a big funder) while solo work also includes various service and "translation" elements that are considered slightly tangential to the scholars' core research mission.

Moreover, the 1:1 ratio between sole- and co-authored outputs suggests that the Commerce faculty's research practices do not coincide with a traditional disciplinary boundary, but are in fact comprised of multiple disciplinary elements. This gives great flexibility to the scholars as they consider the type of projects in which they engage.

At UoM, of the 104 outputs that our FoS survey respondents reported producing over the previous two years, 27 of them were sole-authored and 77 were co-authored collaborative pieces (a 1:4 ratio). This suggests that the high levels of collaboration in the UoM FoS conforms to a strong disciplinary norm for collaborative publishing.

Regarding co-authored outputs, Figure 5.14 shows that 83% of FoS respondents said that they produced international journal articles during the previous two years, followed by international conference papers (54%), national conference posters (38%), international conference posters (33%), book chapters (21%) and national journal articles (17%). This shows that international journal articles are the main vehicles of scholarly communication for FoS members.

For sole-authored outputs, most would be considered "alternative" outputs by our definition, mainly briefings, magazine/newspaper articles and radio/TV presentations (44% for each category). Very few FoS scholars produced traditional formal publications as sole authors. Indeed, it appears that co-authorship is the norm for formal outputs, while alternative outputs (which have little or no impact on promotion opportunities) are the norm for individuals who want to share some aspect of their work beyond the academic community. This FoS publication profile makes sense, given: the scientific disciplinary norms that structure the faculty's communication activities; the historical, geographic and demographic realities that mildly privilege international communicative engagement over national engagement; and the reward and incentive structure that places a high premium on international peer-reviewed publications.
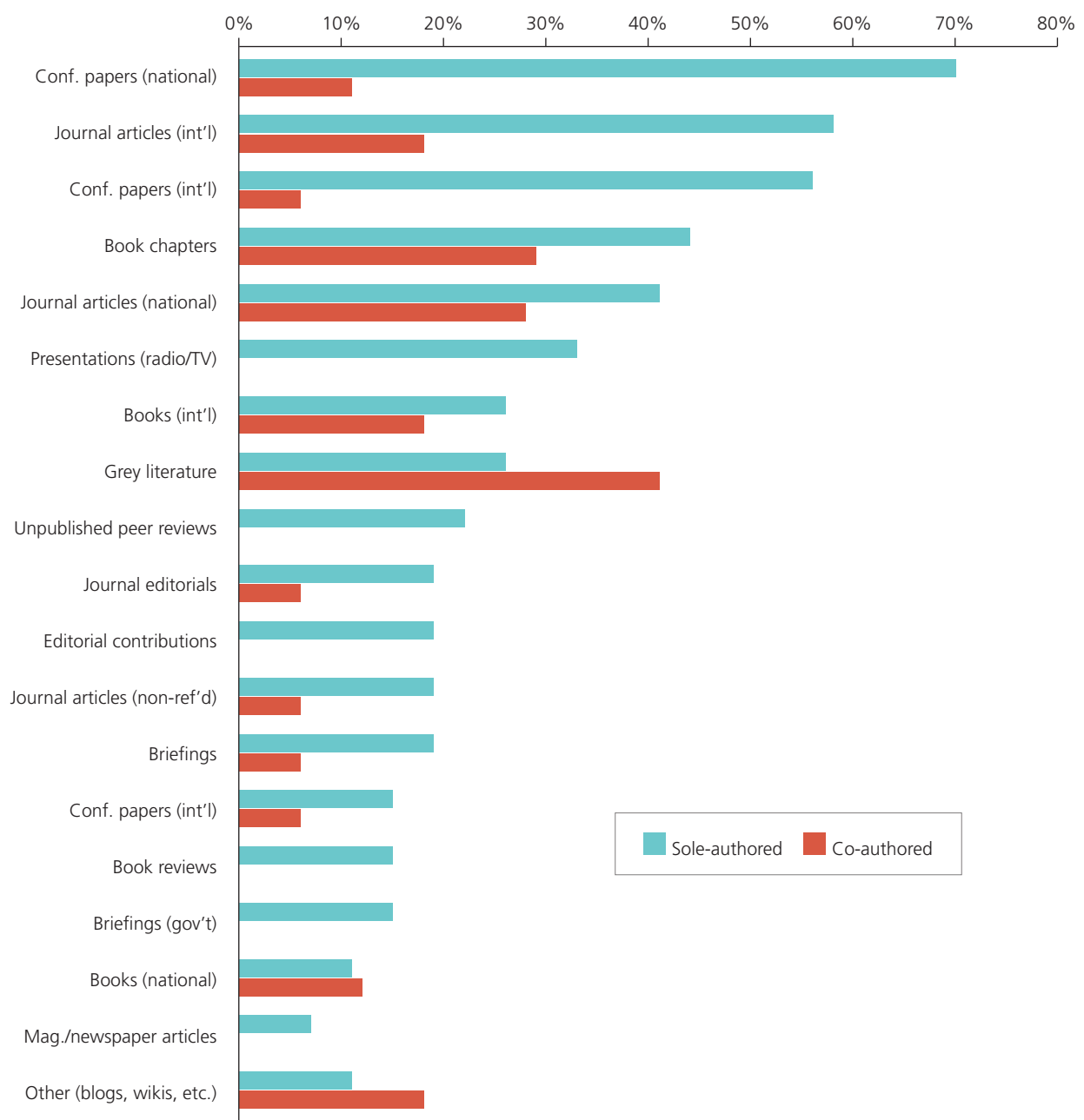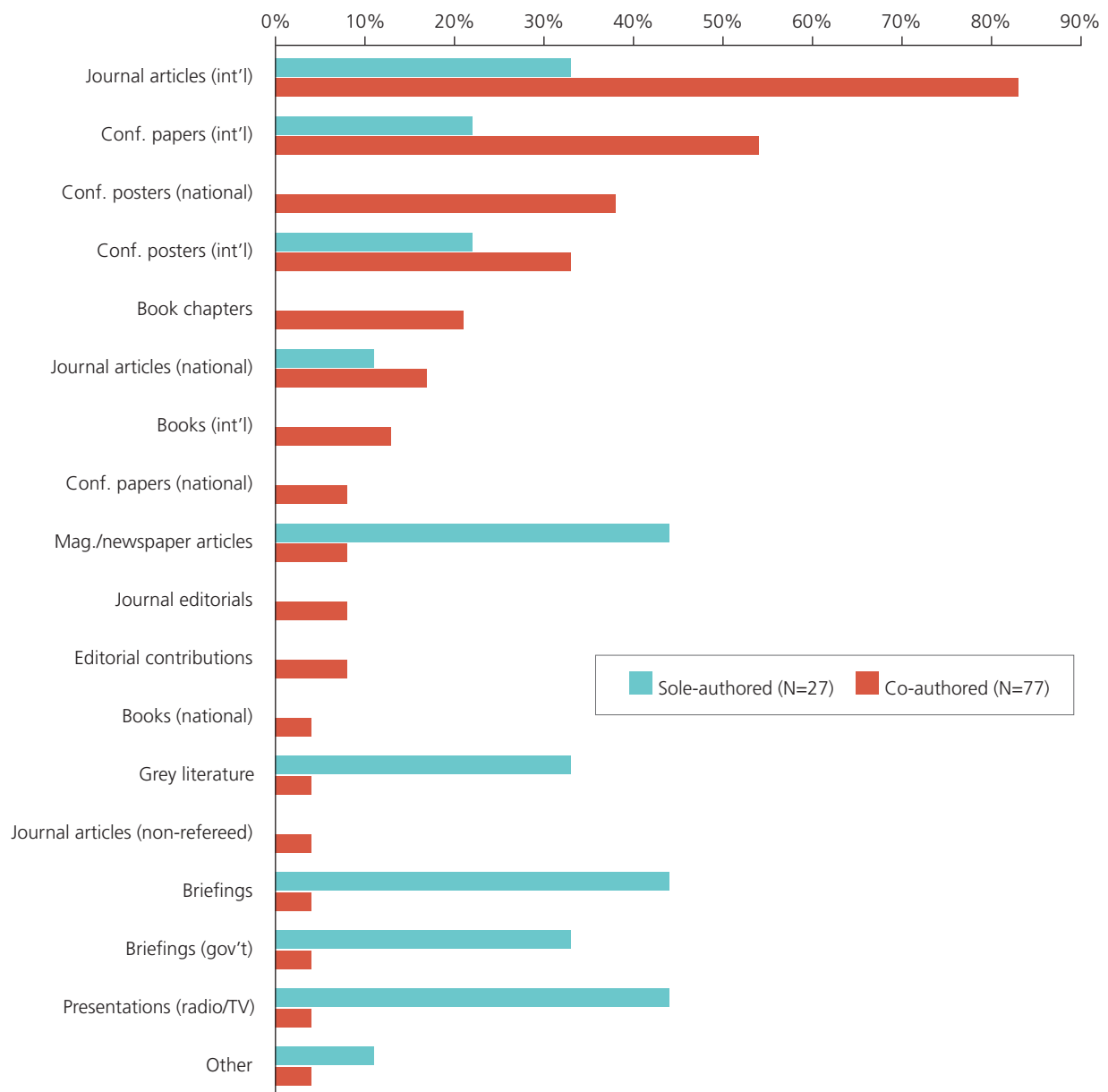
Figure 5.14 UoM FoS research production over two years, by % of respondents producing these outputs

At UNAM, of the 206 outputs that our FHSS survey respondents reported producing over the previous two years, 156 of them were sole-authored and 50 were co-authored collaborative pieces (a 3:1 ratio). This is a typical ratio for humanities and social sciences work where individual research activity remains the norm. Of the 156 sole-authored outputs listed by the 50 survey respondents, international conference papers were the top output (42%) followed by international journal articles (39%), national conference papers (36%), grey literature (33%) and radio/TV presentations (28%).
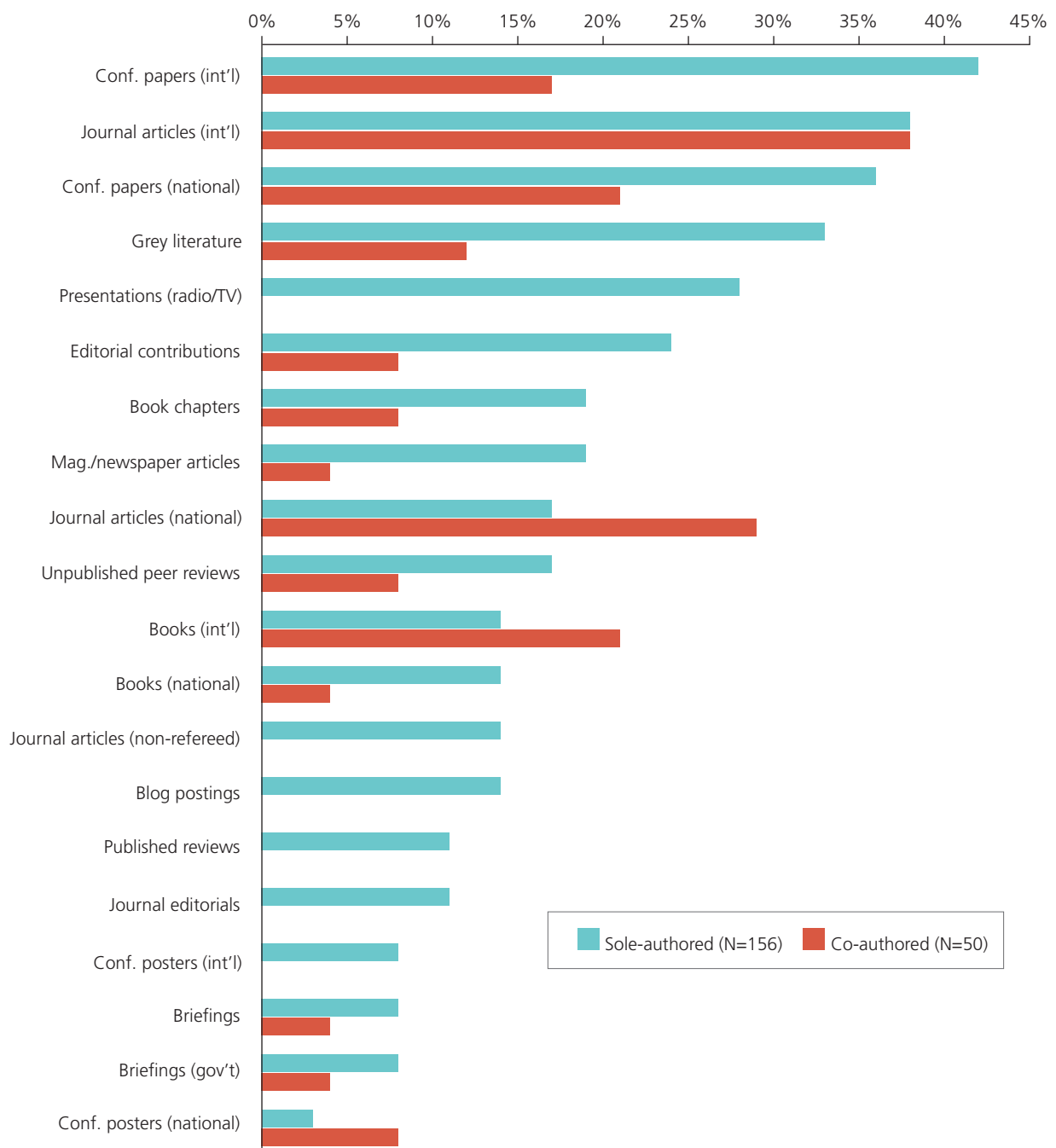
Figure 5.15 UNAM FHSS research production over two years, by % of respondents producing these outputs

The sheer diversity of outputs produced (even if in relatively small numbers) reveals the complex engagement that FHSS scholars seem to have with their work and their various audiences.

Of the 50 co-authored cases, Figure 5.15 shows that the majority were international journal articles (38%), national journal articles (29%), international books (20%), national conference papers (20%) and international conference papers (17%). Thus the rate of international journal article production was basically the same whether sole-authored or co-authored (38%).

Online dissemination activities

With the limited time and opportunities for direct engagement with their intended audiences, scholars are able to get around these constraints by simply making their research available online in some fashion, allowing audiences of all types (intended and unanticipated) to access it.

When asked if their research was available on the internet to the general public, most of our survey respondents said that at least some of their outputs were available online, but their responses revealed some crucial distinctions in their activity systems.

Table 5.7 Responses to question "Is your research available online for the general public?"

	UB FoH	UCT Comm	UoM FoS	UNAM FHSS
Yes, a lot of it	35%	25%	33%	25%
Yes, some of it	54%	14%	40%	22%
Yes, a very small selection	4%	39%	13%	18%
No, none	8%	21%	13%	35%

As can be seen in Table 5.7, the response by UB FoH scholars is relatively positive compared to other institutions in our study, though it does not necessarily correlate with intention or interest in online visibility. As discussed above, UB FoH academics do not have great enthusiasm for open access dissemination. And when they say that their work is "available" on the internet, they often mean that it has been posted by a publisher on their commercial website, requiring a fee from users. (Technically, these papers are "available to the general public" because anyone can pay the fee to download them, but in reality, because the fees are often very high, they remain essentially beyond the reach of the general public and are therefore not open access.) Also, some scholars say that their work is available on the university IR. However, this was likely not their decision. The UB library has been actively "harvesting" UB scholars' journal articles from publishers' websites and then linking to them for download. Thus their visibility on the IR cannot be taken for an interest in profiling their own work.

UCT Comm members' relatively low online percentages are due to the fact that most scholars continue to operate according to a traditional model of scholarly communication in which research production and publication, not dissemination, are the key elements. Scholars have been free to leave dissemination issues to book and journal publishers,

secure in the knowledge that at least their peers will have access to their outputs. Thus many of their publications have been print-only outputs, or they have been locked behind expensive subscriber paywalls. Their rewards and incentive system does not provide extra recognition for outputs which are available online, thus it has never been imperative that they make them so. Moreover, the traditional communication model delivers their outputs to the audience that they are most keen to reach, their peers. Thus, many have felt that it is unnecessary to try to push for open access or publicly available online dissemination when the traditional model is already doing what they want it to do.

The level of online availability for UoM FoS scholars matches their positive support for OA dissemination. However, when these scholars explained how those outputs were made available online, their responses revealed that this was not due to any strategic act on their part, but was rather just a coincidence that the journal that they published in was open access. As we have discussed above, most FoS scholars choose publication outlets based on Impact Factor, prestige and thematic appropriateness, with their OA policies ranking much lower in consideration. But because certain disciplines within the sciences have a number of high-volume publishing platforms that are open access (such as arXiv and *PLOS ONE*), the chances of their outputs ending up in an OA publication are relatively high.

At UNAM, while a majority (53%) have either none or very little of their work available online to the general public, this apparently negative open access reality needs to be put into context. First, a number of the teaching-oriented FHSS scholars have not produced research outputs yet, thus they would likely not have any outputs to make available yet. Second, most of the journal articles and conference papers that they have produced have been disseminated through traditional subscription or closed communication models. Third, many scholars suggest that they could make some efforts to get their outputs online free to the public but that they do not have the time to do so. Essentially, they're saying that, considering all of the constraints on their time and capacity, they lack the support needed to make their work more visible online. That is now changing.

As a final note to this issue, a crucial complicating factor here is the fact that many UB FoH, UoM FoS and UNAM FHSS scholars are, at times, reluctant to share their research online and "put themselves out there" due to:

- a culturally informed sense of personal modesty (not wanting to call attention to themselves)
- an ambivalence about the quality of their research ("being exposed")
- an anxiety about having no control over how they might be represented on the internet
- a worry that others may steal their ideas/data (especially if still in gestational form)
- a fear of offending their research subjects, many of whom they might continue to encounter (especially on a small island like Mauritius)
- a concern for damaging one's own reputation in a small country where "everyone knows each other" and can influence your future prospects

- a minimalist communications strategy (where dissemination is achieved through reading a paper at a conference, or perhaps allowing a journal to publish it, but nothing further)
- a teaching- rather than research-oriented approach to scholarship (which speaks to one's sense of academic identity, as a "teacher" rather than a "researcher").

To illustrate this reluctance, one academic in Mauritius discussed a politically sensitive research study that had bearings on whether a group of people might decide to claim compensation from the government. "If the press got hold of this, it's very damaging and then the Ministry will come and say to us, 'You know, we trusted you with this and this is what you said to the papers', and they would have to explain and it would look bad."

Indeed, in small country contexts where the research community is tiny and the work that it produces may have profound effects on local political outcomes or social perceptions, scholars may be reluctant to call attention to the fact that they were involved with it, especially if it is controversial or embarrassing for anyone concerned. Indeed, a number of scholars shared their concerns about the political implications of their work and how it could affect them personally. One scholar, echoing a number of others from the three countries, stated, "Here everything is political, ministers are very susceptible about their image and they want to be seen to be doing a good job," thus scholars must think twice before making their work highly visible online, even if they want to.

Research and dissemination networks

A key aspect of how a scholarly communication ecosystem functions is based on whether the scholars within that system feel connected to each other and whether they feel connected (as researchers, as scholars) to groups outside of it. This feeling is usually indicative of an activity system that is characterised by a strong research culture. It also gives an indication of whether scholars feel that they are "researchers" or "teachers", in that those engaged in research will typically feel a greater sense of belonging to a broader research network.

To the question, "Do you feel part of a broader research network or community of scholars?" two thirds of UB FoH survey respondents said yes, four fifths of UCT Comm respondents said yes, almost three quarters of UoM FoS scholars said yes, and half of UNAM FHSS staff members said yes.
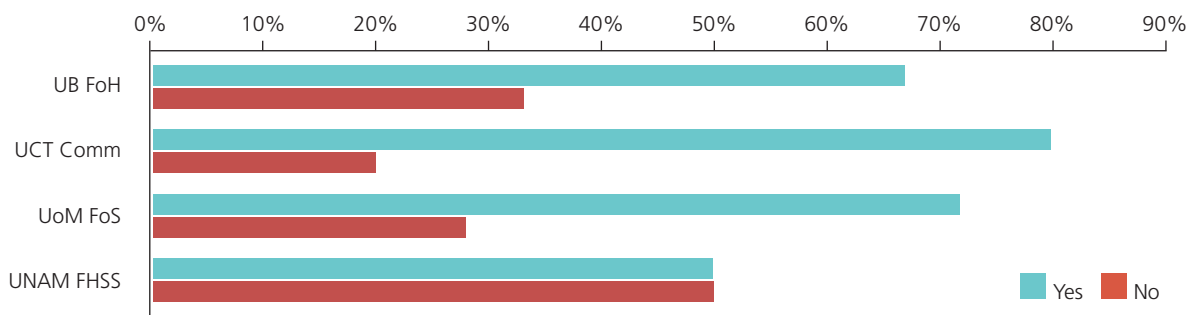
Figure 5.16 Response to: "Do you feel part of a broader research network or community of scholars?"

However, of those who do say that they feel connected, it is often with quite different groups depending on the faculty in which they are situated. Thus, as a sub-question of the one above, we asked affirmative respondents whether their connections were located internationally, institutionally, regionally or outside of universities altogether.

At UB, as Figure 5.17 shows, the relatively higher sense of belonging to an "international" community is likely due to the fact that a high proportion of FoH scholars completed their graduate training abroad in the UK, Canada, the US and so forth. Many also studied in South Africa, a country that, by Botswana's standards, is seen as both "regional" and "international". Many academics have maintained the relationships they cultivated during graduate school and have made new connections through international conferences. Though they report a lesser sense of international belonging than scholars at our other partner universities, it is still greater than any other category for them.

UB's comparatively strong "regional" response is indicative of the networking opportunities that are found at disciplinary conferences held by the regional associations of professional bodies, including for librarians, archivists and information managers in Southern Africa. Many of these have their own journals, which, while not being WoS-ranked, are peer-reviewed and valuable in those circles.

On campus itself, managers and academics lament the fact that there isn't a greater sense of community and collaboration. One manager said, "Talking is very minimal. There is a tendency for me to hide my work from the other person … I don't want them to steal my notes, my ideas. Particularly those in the same field as myself, there's a bit of competition, so there is not much discussion. There's general discussion, but not really about the actual work that one is doing."
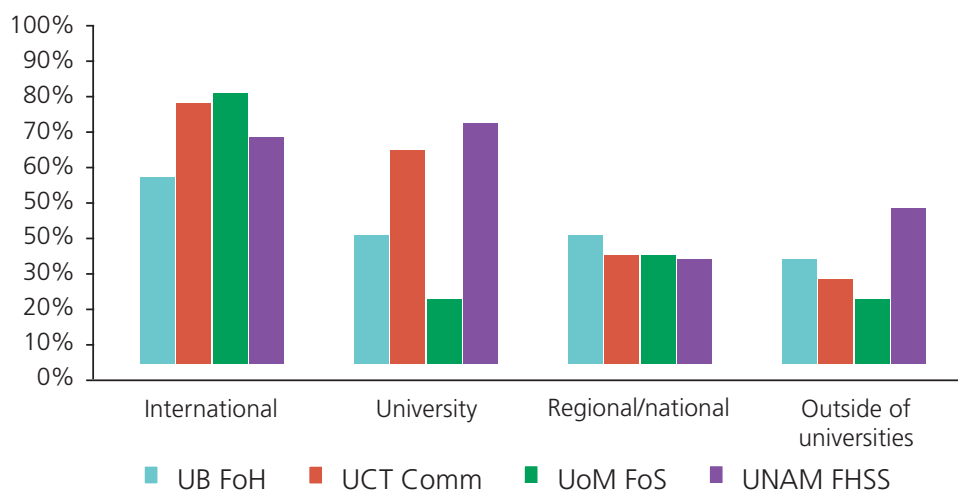
Figure 5.17 Location of scholarly research networks and communities

At UCT, the Comm scholars' response shows how networked the faculty's scholars are internationally, due in part to where many of them come from or were trained (often abroad) and due to the high regard that they enjoy as collaborators from the African continent. They are highly sought-after colleagues for international projects, often acting as the "African experts" in multi-country or multi-continental studies.

The fact that the majority of Comm scholars also list the university as a location of their research network shows how deep the expertise is that exists in the faculty and how rich the environment is in terms of collegial communication. As one of the few research-intensive universities in the country, UCT's scholars often take advantage of their literal proximity to each other, involving themselves in critical communicative communities.

Lastly, while the regional identification of 32% is virtually identical to the proportions expressed at the other Southern African universities we researched, UCT Comm scholars showed the highest comparative sense of belonging to communities "outside the university" (at 46% of the 80% who said they feel a sense of broader research belonging). This is due to the high level of practical application that much of commerce faculty's work has in governmental and industrial circles. Their work matters beyond the academy, thus many scholars feel a sense of the connection with these outside groups (Cooper 2009). Excepting for UNAM, this is not the case at the other institutions, where university linkages with the government, industry and civil society are often weaker.

At UoM, the FoS scholars' high international/low university response is best explained by the fact that, as a small university, many of the academics are the only experts on the campus in a particular field. While a number of scholars may work in the Physics department, for instance, each of them will specialise in researching quite different areas, making it difficult for them to collaborate on research projects. Thus UoM FoS scholars tend to lack the density of connections both within the university and within the country to create a deep sense of research belonging there. But for historical and cultural reasons, those networks are not so much regional as they are international. Many FoS academics obtained their PhDs overseas, with France as a particularly important site for postdoctoral study and early-career work.

The simple lack of population density – and therefore researcher numbers on campus – made it necessary for them to turn outwards for such connections. For this reason as well, UoM scholars were more likely to feel part of an "international" network (81%) than any of the scholarly cohorts that we profiled during our work.

UNAM FHSS scholars' response was unique in that, not only did only half feel a sense of broader connection, but of those, the highest proportion was with those in the university. This is different from the other universities we surveyed where most respondents said their networks were international as opposed to institutional. In this case, the relatively high institutional response reveals the collegial sensibility that the FHSS leadership has sought to instil in the faculty through various seminars, the annual faculty research conferences and the collaborative running of the faculty journal. As members of a university where the research culture is still nascent, these locally collaborative efforts have created more meaningful connections within the faculty than the opportunities beyond it.

Translation and engagement

The fourth and final phase of the research and communication cycle entails translation and engagement. This is the process of sharing one's research beyond the academic community – with students, policymakers, community leaders, industry personnel, etc. – in an accessible language and format.

This work is often unacknowledged in university reward and incentive structures (which focus primarily on scholar-to-scholar communication), though it provides one of the most productive and direct mechanisms for university research to impact national development imperatives. It shortens the feedback loop by which scholarly research gets into the hands of government ministers, community organisers and business entrepreneurs, all of whom may be able to use it for enhancing social welfare, growing the economy or spinning off new innovations.

For the purposes of this discussion, we will focus on the extent to which scholars utilise free Web 2.0 technologies to share their research and enhance their scholarly visibility, and then discuss how they engage with broader audiences by popularising their research.

Web 2.0 sharing

There are a number of freely-available Web 2.0 technologies, or "social media", that would allow Southern African scholars to overcome certain obstacles that derive from their context (such as geographical isolation from other international academics) and achieve goals that are important in a developing research environment (such as enhanced collaboration opportunities with others). However, these tools do not yet play an important part in most of the scholarly communication ecosystems we profiled.

We conducted a "shadows and footprints" exercise to determine how engaged our pilot site participants were with Web 2.0 technologies on the internet.[121] (At UoM and UNAM, the faculty research site was also the pilot site; at UB, it was the Department of Library and Information Studies (DLIS) within the FoH; and at UCT, it was the Southern African Labour and Development Research Unit (SALDRU), a unit within the School of Economics in the Faculty of Commerce.

A "shadow" is a person's passive online profile that is created without any special effort on that person's part. It is usually made up of random bits of information drawn from events (conference attendance) or organisational contributions (to an academic professional association) that are made available on different websites. It is also generated by aggregators, such as Google Scholar, which create an impression of a scholar's productivity and impact based on the number of citations it can connect to a scholar's articles or books. In both Southern Africa and the global North, the only information available about many academics comes from the shadows they have cast on the internet through their normal activities. They have not engaged with the internet in any strategic way to determine what the public learns about them and their work (Brown 2011; CIBER 2010; RIN 2009, 2010).

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121 This research was carried out in September 2012 and thus may have changed slightly since then.

In contrast, a "footprint" is the profile created actively by a scholar on personal websites, departmental web pages, social media platforms (LinkedIn, Facebook and Twitter) and scholarly profiling sites (Academia.edu, ResearchGate and Mendeley). For many scholars internationally, this simply means giving their CVs to a university web administrator to upload onto their departmental web pages. But for the more proactive, it means engaging in a concerted effort to present a coherent narrative of their research interests and activities, plus a list of (and links to) their research outputs. It may also mean a more regular form of personal communication to the public through tweets, shares and blog posts.

According to this research exercise we carried out in September 2012 for our pilot sites, the only Web 2.0 tools that UB DLIS scholars engaged with any interest was LinkedIn. 44% of the staff members had profiles on the site, with the majority of those having fewer than 10 connections (which suggests a nominal, passive use of the site). As a profiling service, LinkedIn is better suited to those trying to maintain professional mobility (by providing basic information about one's work history) than creating a rich description of one's research activities, but the low barriers to setting up an account, plus its perceived "seriousness", make it one of the easier Web 2.0 tools for UB DLIS scholars to embrace. In comparison, only 22% of staff members had Facebook accounts and only 17% had Twitter accounts (and none were active tweeters). This is likely due to the fact that the university prohibits the use of Facebook during work hours (across the UB internet system) while the low density of Twitter users in Botswana, and its perceived "frivolity", likely reduces the interest in this communication technology.

This relatively low use corresponds with the globally low level of scholarly engagement with such Web 2.0 technologies (RIN 2010; Ware & Mabe 2010). Elsewhere, while scholars acknowledge the potential that these social media have to enhance collaboration (Gu & Widén-Wulff 2011; Morgan, Campbell & Teleen 2012; Pearson 2010), many also see it as frivolous, lacking quality control and unnecessary for successful scholarly dissemination (RIN 2010). Amongst DLIS scholars, the low level of social media is less a sign of resistance than one of unfamiliarity with its potential and concerns about the time that engaging it may involve.

The scholarly profiling platforms – Academia.edu, ResearchGate and Mendeley – made essentially no impact on the department's scholarly communication activity, with only two of the 18-member department utilising these services. Most, in fact, had never heard of these sites.

More crucially, UB DLIS scholars' internet footprints still remain far smaller than most of their Northern colleagues who at least enjoy the benefit of a departmental web page that describes their research activities and outputs. At the time of writing, no DLIS scholars were profiled on a departmental website. In the humanities faculty, only a few departments provided lists of their staff members, most just noting where they received their degrees, but not providing any more details.

The combination of the university's tight control of the website and the academics' low engagement with scholarly profiling sites (which would allow them to get around certain

institutional barriers) means that UB FoH scholars have far smaller online footprints than they need to have.

Amongst SALDRU scholars at UCT, the only Web 2.0 tools that they engaged with any frequency were Facebook and LinkedIn. 56% of the unit's members had Facebook accounts, though most used it for personal, not scholarly, communication. Meanwhile, 50% had LinkedIn profiles, with half using it actively (boasting dozens of connections) and half using it passively (with only a few connections). In comparison, only 13% of SALDRU members had Twitter accounts, though none actively tweeted messages themselves (at least not during our engagement with them). They were more likely to consume content, following the tweets of other academics, journalists, think-tanks and foundations.

However, due in part to SCAP's engagement with SALDRU, one of the unit's administrators created and maintained an active Facebook and Twitter profile for SALDRU, sharing information about the unit's publications and seminars with a growing number of followers. Though the unit's scholars themselves did not appear to be active consumers or producers of posts or tweets, the administrator was able to use her knowledge of these social media to reach Facebook and Twitter users who were interested in SALDRU updates.

Beyond social media, the more specifically scholarly profiling platforms – Academia.edu, Mendeley and ResearchGate – played very little role in the unit members' scholarly communication activity. One reason why this was the case was because virtually all of them had personal web pages on their departmental sites where they posted information about their research interests and publications. Many also posted CVs on those sites, making them feel that it would be redundant to post all of that same material on a different site.

Thus, because these scholars were active producers of academic content, they enjoyed some level of visibility online. Their personal profiles were provided on their departmental websites and some of their outputs were profiled by journal or book publishers, which were findable through search engines such as Google and Google Scholar (where articles are listed with citation counts provided). But because departmental web page profiles are often written more as a matter of administrative obligation than personal desire, they sometimes provided a thin understanding of scholars' work because the scholars do not invest the time or energy in developing profiles that would provide full pictures of their work. Moreover, because scholars do not always list their publications on their personal pages, their outputs on the internet appeared as random or isolated rather than part of a broader intellectual effort. Indeed, for many SALDRU scholars, their scholarly shadow was more pronounced than their scholarly footprints.

Amongst UoM FoS scholars, the only Web 2.0 tool that they engaged with any frequency (48%) was LinkedIn. Thus, at least as revealed through these various profiling services, UoM FoS scholars cast a very light "footprint" on the internet. The same was true of their scholarly "shadows", especially those produced by the university's website. Though each department had a website on the UoM site where faculty members could profile their own work – or where the administration could provide such information

– only 21% of UoM FoS scholars had even basic details about themselves there. The picture that emerged was that UoM FoS scholars were essentially disengaged from Web 2.0 social and scholarly technologies.

Given that these virtual technologies offer FoS scholars the opportunity to overcome a number of the challenges facing them regarding scholarly networking, collaborating and sharing from their isolated position in the Indian Ocean, it may appear ironic that they did not use them more often. But in reality, they have ways of dealing with these challenges, typically by relying on more traditional methods of collaborating and networking, by keeping in touch with colleagues abroad from their graduate student days, by meeting new colleagues at conferences and by maintaining those relationships by phone or email. Considering the temporal investment involved in learning new social media technologies to achieve these ends, FoS scholars prefered to use more familiar forms of "physical" (as opposed to "virtual") social networking.

Lastly, UNAM FHSS scholars utilised a number of popular Web 2.0 tools such as Facebook/Myspace (70%) and LinkedIn (50%), but they rarely used them for academic purposes. These were utilised primarily for social purposes, though LinkedIn offered a deeper dimension for occupational profiling. Thus, similar to UoM FoS scholars, UNAM FHSS academics cast a very light "footprint" on the internet.

Part of the reason for this is that most scholars are using the departmental website as the space in which they profile their scholarly activity. When SCAP started its research at UNAM, there was already a solid amount of information on the UNAM FHSS website concerning the education, background and research of each scholar. Since then, the website has been redesigned to allow for a more attractive and robust presentation of personal activity, and – more importantly – the faculty initiated a scholarly profiling effort (an e-portfolio platform) that will tie in with the development of the IR, linking profiles with outputs directly. This will massively enhance the online "footprints" of these scholars. Indeed, it will essentially take what was previously a "shadow" (out of scholars' control) and turn it into a "footprint" (within their control).

Rewards and incentives

The last element of these Southern African scholarly communication ecosystems to explore is their rewards and incentives systems that, in part, guide scholars' research production and dissemination. The values analysis discussed above shows that scholars have multiple, and often quite personal, reasons for conducting research, but the official rewards and incentives policies represent a crucial leverage point by the administration for influencing the trajectory, quantity, quality and impact of that research. SCAP considers the following as rewards and incentives:

- Financial remuneration, including research subsidies, patents and royalty payments, direct financial rewards such as research awards, etc. (Taylor 2003: 16)
- Increased research budgets, including conferencing budgets and travel expenditure
- Greater choice in postgraduate research supervision
- Greater choice in terms of research focus, methodology, and outputs

- Decreased teaching and administrative responsibilities (Smart 1978: 408)
- Invitation to prestigious academic societies, boards, and review or policy groups
- Formal (institution-driven) recognition from colleagues and peers (Moses 1986)

UB relies on three official mechanisms to regulate rewards and incentives for conducting and communicating research: promotion evaluations, the University Research Strategy and the performance management system (PMS). Each contains a number of provisions that are meant to encourage research production, some through positive means, others through negatives ones. The periodic promotion evaluations that scholars can motivate to go through offer the potential for a status and pay raise if they are deemed to have fulfilled the various teaching, research and community service requirements set forth for the position. But it also offers the potential of rejection by one's peers and superiors, a painful social outcome to be sure. According to UB scholars, promotion opportunities are a reality at the institution, and 83% of our survey respondents stated that it was a "very important" incentive mechanism.

The University Research Strategy also contains specific measures for encouraging research. It states that productive researchers will be able to have some discretion in the time they have allocated to teaching, research and community service. They will be recognised with performance-related pay increases, promotion opportunities and perhaps an official award. And if they bring in external funding, they will be eligible for reduced teaching obligations and some discretionary funds from the overheads for research purposes (UB 2008c: 10). While most faculty members were positive about the research strategy and its incentives, only 11% of our survey respondents thought it was actually possible to have their teaching allocations reduced through such mechanisms.

Incentives are also regulated through the controversial PMS which is described in Chapter 4. During SCAP's engagement with UB, the PMS elicited great emotion both amongst academics and managers. While most were able to see both positive and negative features in it, scholars tended to be more critical. One claimed that the relatively short (annual) assessment cycles meant that "incentives for researching and publishing are all based on short-term, immediate rewards, which end up promoting low-quality, quick outputs." Others claimed that it "shifts attention from core activities to ad hoc plans and short-term goals, i.e. end-of-year monetary rewards." Most agreed that it created as many problems as it solved, encouraging quantity over quality, and other problems related to the impact of constant surveillance. Managers recognised these deficiencies too, but still thought that the PMS had value.

Nevertheless, the PMS points allocation structure remains the scale by which outputs are assessed. It reveals a conventional preference for "high-Impact Factor" journal articles (eight points minimum), highly commended books (eight points), books (six points) and articles in nationally listed journals (six points), followed by conference papers, keynote addresses, seminar papers and other types of research outputs (one to four points each). These scores are then tallied and weighted according to the "research and publications" weighting that each scholar uses to assess his or her own performance. This point system represents an attempt by the administration to balance its desire to achieve both international recognition and local relevance through academic research.

However, the key element missing from this scoring system is any recognition of whether an output is open access, and whether it is profiled on UBRISA. The university has expressed a general desire for these outcomes, but the fact that these aspects are not included in the PMS means that UB is missing an opportunity to promote the broad accessibility of its research.

At UCT, many of the rewards and incentives listed above are available for Comm scholars. The Department of Higher Education and Training (DHET) provides research subsidies for specified publications while the university offers various research funding top-up opportunities (including for conference and travel costs); increased research and postgrad supervision opportunities; excellence and merit awards (for those who make an outstanding contribution in multiple academic activities); decreased teaching responsibilities for those formally identified as "Research Leaders"; participation opportunities for serving on academic boards and policy groups; and peer recognition (both formal and informal).

In addition to the DHET's unique subsidy system, the commerce faculty's guidelines for performance assessment also contain a number of provisions that encourage research production. The periodic promotion evaluations that scholars can motivate to go through offer the potential for a status and pay raise if they are deemed to have fulfilled the requirements set forth for the position. During these assessments, they are evaluated according to four categories of activity: research, teaching and learning, leadership and management, and public and professional service (including social responsiveness). The first and last categories (research and service) are the ones that bear the most on our discussion of scholarly communication.

Regarding research, the guidelines state that "a good, fully competent researcher contributes to knowledge in his/her field of research, at a level appropriate to his/her rank." The evidence for this competence includes:

- Papers in accredited academic journals (or if the journal is not accredited, evidence needs to be provided of the academic standing of the journal)
- Major research projects such as masters or doctoral dissertations
- Chapters in scholarly, peer-reviewed books
- Authorship of scholarly, peer-reviewed books
- Papers in peer-reviewed conference proceedings
- Applied research reports
- Preparing competitive grant proposals and/or obtaining research funding from outside of the university
- Being rated as a researcher by a recognised research body (e.g. the NRF) (UCT 2012b: 2)

Thus, the faculty stresses not only the primacy of the research role in a scholar's work, but also research production that is aimed primarily at fellow academics through journal articles, books, book chapters and conference proceedings.

Regarding public and professional service (including social responsiveness), the guidelines state that staff members are assessed according to their contributions "to bodies outside the University." While this includes various types of service – as office bearers in professional societies, as editors of research journals, as members on national research or education committees and as advisors to governmental regulatory bodies – it also comprises activities that deal with disseminating scholarly research to non-academic audiences. The guidelines include:

- being asked to give public lectures or participating in public education
- according service to NGOs, including participation in committees and councils, as well as contributions to policy forums
- communicating and diffusing the results of academic expertise and research to the public media
- preparing policy documents for public bodies, companies and civil society agencies
- publishing results from consultation to a profession closely linked to the candidate's field of study
- conducting professional and private work based on the staff member's academic skills and which contributes to scholarship
- authorship of textbooks
- recognising senior staff members for assisting junior staff in making contributions to public and professional service.
  (UCT 2012b: 3)

Thus, the Comm faculty (and UCT in general) does desire that scholars look beyond the academic community for communicating their research, though it ranks this well below that of communicating with fellow scholars. As Table 5.8 shows, while academics are given scores of 1–10 for each of the four categories relative to the staff members' current job levels and their agreed-upon activity weighting, their service work and communication to outside audiences will likely rate far lower than their other activities.

Table 5.8 UCT Comm scholars' performance assessment weights

Scholarly activity	Weight
Research	25–50%
Teaching and learning	25–50%
Leadership and management	10–25%
Public and professional service (including social responsiveness)	10–25%

While this weighting system tends to place a higher premium on research and publication activity than at other Southern African universities, UCT Comm scholars did not believe that this focus was as intense as it is in other parts of the world. For instance, one senior academic commented, "I don't think we're on a publication mill like they are in the USA. I think if we were on a publication mill I'd probably be a lot more vociferous about the importance of some of these other [outputs and measures of achievement]."

At UoM, scholars are incentivised in only a few of the categories listed above. At the national level, the MRC sponsors the Best Mauritian Scientist Award which provides a

cash prize of MUR200,000 (USD6,451), a stipend of MUR50,000 (USD1,612) to be used for visiting overseas institutions and an award ceremony.[122] This is a useful form of recognition, but according to scholars, it does not have a great impact on their research and dissemination decisions.

At the institutional level, the UoM Strategic Research and Innovation Framework (SRIF) commits to "reward excellence and achievement in research" (UoM 2009: 9) through:

- financial remuneration, such as prizes for "outstanding accomplishments in research", "new prizes and awards to best researchers on campus" and the creation of a "UoM Research Excellence Award"
- increased research funding, including provision for overseas workshops and conference attendance
- reduced teaching and administration loads to active researchers
- formal recognition, such as "profiling the achievements of UoM researchers" and "publication awards for quality papers".
  (UoM 2009)

These are all excellent proposals, but FoS scholars say that they are not implemented. One of the reasons why implementation has been incomplete is because of the fluctuations in the top levels of the administration. The former VC, who helped to spearhead these strategies, resigned, and a new institutional champion has yet to emerge to drive the implementation of these strategies.

Because of the shifting fortunes of various institutional strategies, the primary reward and incentive structure to which UoM scholars respond is the official promotion policy. As our values discussion showed, this acts as a highly motivating factor in spurring FoS research. For promotion consideration, scholars are assessed according to three criteria: teaching, research and service (to the university, the profession and the community). Table 5.9 shows the relative weightings that each category can receive, depending on the preferences of the promotion candidate.

Table 5.9 UoM Promotion assessment guidelines

Promotion	Teaching	Research	Service
Lecturer to sr lecturer	30–50%	30–50%	10–20%
Sr lecturer to assoc. prof	20–30%	45–55%	20–30%
Assoc. prof to prof	10–20%	55–65%	20–30%

As Table 5.9 shows, the relative value of teaching for promotional purposes declines with rank while the research and service components go up. To assess scholarly research, the promotion policy uses a point system in which all types of scholarly outputs are allocated a numerical value which are weighted (according to whether the outputs are of a "very high category" (1 × full mark), "high category" (0.8 × full marks) or "average category" (0.6 × full marks)) and totalled to give assessors a raw score to grade the applicants. The

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122 Best Mauritian Research Award, available at: www.mrc.org.mu/Documents/Schemes/BMSAba5.pdf

applicant can argue for the category in which he or she thinks a publication falls, usually relying on indices such as the WoS rating of the journal in which an article is published (if there is one), the level of importance that a particular set of conference proceedings are to one's field, etc.

With regard to format types, the point system rewards the publication of internationally published books, journal articles, book chapters and refereed papers in conference proceedings over those published nationally (by a two-to-one margin), and provides mild recognition for alternative outputs such as reports, technical papers and briefings.

Nevertheless, this leads to a situation in which publication is often erratic, achieved only when scholars seek promotion. It does not provide the constant pressure to produce outputs annually because there is no recognition for temporal consistency. And for scholars who have chosen a more teaching-oriented approach to their careers, it provides little incentive to produce any research at all. Moreover, some scholars suggest that there is no real penalty for not conducting research (if you are not seeking promotion) because teaching remains scholars' "real" obligation, as one scholar shared:

> *Your performance is measured based on your teaching, and maybe your administration, how far you've been able to successfully run the teaching programme for maybe two years. But even if you do have publications it's no big deal … If the research doesn't get done, the university doesn't bother. If the teaching doesn't get done, the university bothers.*

Of course, for those scholars who do seek promotion, the reward and incentive structure motivates them well enough to publish. This is the case for the majority of FoS scholars.

At UNAM, the Research Strategy (Kiangi 2005) states that scholars are meant to be incentivised in a number of the above categories:

Financial remuneration: Income after costs from commercially viable original intellectual property will be divided in the following fashion: one third paid directly to the inventor(s), while two thirds are divided equally amongst the research group, faculty and university.

Increased research budget: UNAM offers a greater allocation of the university research fund to research groups that publish prolifically (Kiangi 2005: 13). Research groups looking to increase their research infrastructure may, subject to approval, request that the subdivision of income that would normally be allocated to the university from contract work be instead allocated to the group (Kiangi 2005: 30).

Profits earned on contract research may be divided equally between the faculty, the research group involved and the university. Special dispensation for the funds allocated to the university to be redistributed to the research group may be made if the group intends that the funding be used for research infrastructure development. This may be seen as an incentive for researchers as it would increase the prestige of the group and its ability to perform further research, which facilitates future employment for individuals.

Research focus, methodology, outputs: "In order to encourage staff undertaking research, the University affirms the following principles regarding research: the individual scholars will be free to select the subject matter of their research, to seek support from any source for their work and to form their own findings and conclusions" (Kiangi 2005: 12).

Decreased teaching and administration: "For those active in research, the Research Group Leaders and Research Programme Chairpersons will need to discuss with the Head of Department to arrive at a reasonable portfolio of teaching and research commitments for an individual staff member" (Kiangi 2005: 11). Also, "The University will work to provide staff with generous sabbatical leave, and research leave to allow staff to publish results of important research outcomes that would otherwise take longer to reach publication" (Kiangi 2005: 12).

Context-specific incentive: The Research Strategy makes special consideration for research staff on fixed-term contracts, allowing them accelerated promotion (able to apply for promotion after one year, as opposed to the two- or three-year minimum for long-term academic staff). In addition, whenever funding allows it, a 10% premium should be added to the basic salary of a researcher to compensate for their less-secure positions (Kiangi 2005: 44).

FHSS scholars say that most of the incentives above are useful in spurring greater research activity, even if they do not necessarily ensure that the research outputs get disseminated in an effective or open manner. They suggest that there is room for improvement in both the formulation and implementation of these incentives (a fact that has led to the development of the new communications policy) (UNAM 2013).

In addition to these incentives, the administration hopes to motivate scholarly research production through its various promotion and performance guidelines (UNAM 2011b). Thus UNAM research is assessed on a point system that feeds into a broader promotion system. Points are allocated to different types of research and publication outputs. To earn promotion to a higher position, staff must earn a certain number of required points. Essentially, with each promotion up the ladder, scholars are meant to show greater and greater research proficiency, productivity and impact in their fields. They must also possess the requisite advanced degree (i.e. MA or PhD) and have served a certain number of years in the current position before moving up. Table 5.10 shows the relative point values given to the different scholarly outputs that UNAM recognises.

This point system rewards a wide variety of outputs, taking into account both the desire for quantity and quality. As one would expect, it rewards scholar-to-scholar outputs, while allowing for a good deal of discretion in whether the points allocated will be at the high or low end of the range (depending on quality and perceived importance). But it also rewards alternative outputs, allowing, for instance, for the same number of points for the publication of a teaching manual as a journal article (depending on quality). This encourages scholars to produce outputs in multiple formats for multiple audiences.

Table 5.10 UNAM point allocations for scholarly outputs

Category of publication	Range of units
Academic books (ranging from medium-sized standard academic work to original, substantive academic contribution)	3–8
Smaller books and monographs (depending on volume and academic weight)	1–4
Chapters in books	1–4
Article in refereed journal/proceedings (depending on research input, academic substance and originality)	2–4
Research report (depending on the quality of the research, sample size, depth of analyses, etc.)	1–2
Academic papers published in conference or workshop proceedings	0.5–1
Consultancy, technical and commissioned reports available for reference in local/regional libraries	1–2
Teaching manuals and study guides (depending on size, format and academic quality)	1–4
Contribution as editor (ranging from compiler of workshop or conference proceedings to editor of academic work)	1–3
Creative work: original creative work (art, music, novel, drama, literature, computer software, electronic media, video production, etc.); depending on the nature and quality of the creativity	1–4
Unpublished national and international conference papers and posters	0.5–1
Article in popular publication e.g. newspapers and magazines – these are not considered as refereed scholarly works and a maximum of one publication point can be earned under this category	0.5–1
Recognition for administrative duties	4–8 (1–2 refereed articles)

For a development-oriented university, this point system tries to ramp up the production of traditional scholarly outputs while also trying to communicate scholarly knowledge beyond the academic domain by recognising alternative outputs that are more likely to be aimed at civil society, industry and government, the very groups that can leverage scholars' research for developmental purposes.

Do these reward and incentive systems achieve their goals?

However, the key question to ask about the reward and incentive structure is not just whether it is resulting in the desired quantity and quality of research outputs, but whether it is having the impact that the university and the government wants it to have. To put the question in another fashion: a university's values should inform its mission; its mission should inform its policies (rewards and incentives); and its rewards and incentives policies should yield the impact that it desires (Figure 5.18). But do the rewards and incentives actually lead to the impact that the university says it desires?

Figure 5.18 Visual representation of rewards and incentives' relationship to impact

1. Does the UB reward and incentive system help FoH research outputs to:

- aid national development?
- secure international recognition?
- reach a broad national audience?

Only the university and the government can say whether the university's research is aiding national development, but the policy environment and the research funding priorities of the Office of Research and Development (ORD) enhance the likelihood that it will do so since development-related projects are prioritised in terms of research funding allocation.

Regarding the desire for international recognition (prestige) through university research, the PMS's high point allocation for Impact Factor journal publications offers one method of trying to secure it. Such publications (in WoS-rated journals) are often the only metrics that matter to overseas assessors, thus the PMS does provide a useful incentive for scholars to produce them. However, if the PMS runs in tandem with an annual performance assessment that promotes quick and easy outputs, then this could undercut the longer-term efforts necessary for high-prestige outputs.

Lastly, the PMS incentivises the production of multiple output types, a fact which increases the likelihood that UB research will be accessible to multiple audiences nationally. But it is not enough to produce outputs in different genres to reach a broad set of stakeholders. It is also important to find the right method for disseminating those diverse outputs, which we believe is open access.

2. Does the UCT reward and incentive system help Comm research outputs to:

- secure international recognition and impact the field?
- usher in a knowledge economy?
- spur national and social development?

The answer to the first two questions is largely "yes". Certainly within Africa, UCT is the most "recognised" university for research impact, and Comm faculty members are well-connected to scholars around the world. The faculty is also a large, dynamic body that is responsible for training scholars, researchers, accountants and other types of people who help to drive a knowledge economy. Though it is difficult to quantify the faculty's impact in either of these regards, Comm members feel confident that they are making a positive impact on both scores.

Regarding whether their work spurs national and social development, many Comm scholars believe that it has the potential to do so if it is seen, understood and acted on by the right people (such as policymakers, civil society personnel, industry players, entrepreneurs and so forth). The problem has been that they are less incentivised to communicate their work to these audiences than they are to other scholars (as we have seen above). Thus, most of their outputs end up in scholar-to-scholar communication channels with long feedback loops, meaning that they circulate within a relatively bounded academic

sphere for a long time until they are either forgotten or accepted as "knowledge", and then enter the broader public sphere of communication.

3. Does the UoM rewards and incentives system help FoS research outputs to:

*   achieve the nation's goal of becoming a regional innovation hub?
*   usher in a knowledge economy?
*   spur national and social development?

According to a number of scholars we interviewed, their research does do some of these things, or at least it could if it were more visible, or if it reached the right audiences. The problem is that most outputs end up in scholar-to-scholar communication channels with long feedback loops, meaning that they circulate within a relatively bounded academic sphere for a long time until they are either forgotten or accepted as "knowledge" (at which point they enter a broader public sphere of communication).

In many cases, this long feedback loop makes sense because it is useful for ideas to be vetted by colleagues who can critique, refine and enhance them. But the long feedback loop can also add an unnecessary delay to the dissemination of good ideas to members of the public – including government ministers, civil society organisations, entrepreneurs, community activists, students and industrial players – who could leverage them for developmental purposes in their own contexts. The problem, ultimately, is that it is unclear whether the government (and also the university) can achieve its developmental and "knowledge hub" ambitions by relying on the traditional, closed, scholar-to-scholar communication feedback loop. We would argue that these goals can be reached more quickly through an open communication approach that allows all Mauritians (not just industry players) to have access to UoM's research outputs.

4. Does the UNAM rewards and incentives system help FHSS research outputs to:

*   spur national and social development?
*   usher in a knowledge economy?
*   secure international recognition?

In many ways, the university's policies are in alignment in this regard, especially because it offers substantial recognition for non-traditional communication formats. However, it is misaligned in that the promotion policy focuses on rewarding scholars for publica-tion without any regard for whether publications are open or closed, disseminated to the public or not. The policy appears to trust commercial publishers to disseminate their scholars' work, failing to take into account that most of those publications will only be accessible to other scholars who boast university subscriptions to the relevant journals (many of which UNAM cannot even afford). This was the case while SCAP was engaged with UNAM formally, but at the time of writing this study, UNAM was engaged in a substantial revision of its research and communications policies (which contain explicit OA commitments), thus these may serve to inform the rewards and incentives under which scholars operate in the future.

Conclusion

In this chapter we have seen how challenging it is to make generalisations about different institutions' and faculties' scholarly communication ecosystems, even if they share a common "Southern African" location and identity. Their particular histories, traditions, disciplinary norms and visions for their futures impact how their academics carry out and disseminate research. But we can summarise some of the key elements of those ecosystems for analysis and comparison.

The UB scholarly communication ecosystem is in a period of significant transition. While its activity is still characterised by the goals of the previous teaching-oriented mission, it is starting to grapple with the challenges entailed in moving towards a research-oriented mission. Teaching loads remain heavy, administrative loads are substantial, yet scholars are responding to the new institutional mandate to produce research and publications. But FoH scholars say they require more time set aside for research and more funding opportunities to carry it out. At the moment, they feel pulled between too many obligations, with each of them suffering as a result.

Governed by a strong, centralised administration, FoH scholars feel increasing pressure to ramp up their level of research productivity. But this top-down control has bred a certain resentment of, and resistance to, the administration's dictates, negatively impacting scholars' uptake of UB's IR, the proposed open access commitments in the IR policy and the constant assessment of scholarly performance through the PMS. However, the institutional mandate to produce research has lead to identifiable increases in research production, even if that has not been accompanied by a cohesive communications strategy. While scholars produce a range of diverse outputs, they are relatively content to share them with fellow colleagues through traditional publishing formats (journals, books), regional conferences and seminars. The reward and incentive structure that shapes such communicative behaviour does not give greater recognition to outputs that are open vs closed, meaning that a lot of the research produced by FoH scholars remains unavailable to government, civil society and industry personnel who might be able to leverage it for their own – or broader social – purposes.

At UCT, the Comm scholarly communication ecosystem is a highly productive research activity system driven by a collegial institutional culture and supported by a relatively generous national funding system. As part of an elite university, the challenges facing the Comm activity system are not so much that of the various "lacks" that typify conditions at many other Southern African universities – lack of money, resources, time, staff, capacity, graduate students, etc. – but that of remaining in touch with the realities of the surrounding environment (which, for so many South Africans, *is* defined by a series of "lacks"). Another challenge it faces is recognising that the world of scholarly communication has changed and that the traditional mode of dissemination no longer suffices to assure visibility and impact.

At UoM, while the FoS is the most productive faculty in terms of research outputs – boasting an internationally trained academic staff, many of whom are leading experts in their fields – they work in a largely teaching-oriented institution where research comprises just one of many scholarly activities and where local collaboration remains

rare due to a lack of specialists in the same fields. Governed by a centralised, but weak, administration, scholars are free to determine their own level of research productivity based on the intensity of their personal desire. But this freedom is limited by heavy administrative burdens that make it difficult for them to get even basic things done quickly or efficiently. However, while the high level of autonomy that scholars enjoy allows them to pursue research on their own terms, it also leads to an ad hoc research culture, characterised by highly variant levels of research excellence. This carries over to the question of scholarly communication, in which the institution provides little strategy or guidance for how scholars should communicate their research in an optimal, open fashion. While some senior scholars make a point of sharing their findings with the public through non-academic channels, most are content to direct their outputs only to colleagues through traditional publishing formats. The reward and incentive structure that shapes such communicative behaviour does not give greater recognition to outputs that are open versus closed, meaning that a lot of the research produced by FoS scholars locked behind journal subscription paywalls (unless they are on arXiv or *PLOS ONE*).

Lastly, at UNAM, the FHSS has recently started running its own research journal. It has shown leadership in the field of scholarly communication. Its senior academics, in particular, have shown great interest in and energy for increasing the faculty's research production, visibility and impact. As part of a young institution that is trying to move from a teaching-oriented mission to a more research-oriented one, the FHSS is trying gradually to enhance its nascent research culture so that it can make a greater contribution to national development and global scholarship. This is in line with both the government and administration's desire for UNAM research to lead to developmentally relevant outcomes. It is also one of the reasons why the primary motivations for conducting research are to generate new knowledge and to enhance teaching.

Scholars work in a policy environment characterised by high levels of responsiveness to changing research and scholarly communication trends. The UNAM leadership, and FHSS leadership in particular, have sought to engage the institution with global communication practices even as UNAM remains true to its own locally determined development imperatives. This has meant that the administration has been relatively quick to investigate, develop and promote policies that upgrade research production and open access scholarly communication. Though few FHSS scholars go out of their way (at the moment) to assure that their own research outputs are made open access, they believe in the open access ethic, a sentiment that the administration is leveraging in its new policies.

Chapter 6
The SCAP implementation initiative

SCAP's research design called not only for the collection of data from our various pilot sites, but the active stimulation of them through customised implementation initiatives (or "interventions") that sought to improve the state of scholarly communication within them. Five principle assumptions underpinned these initiatives. They would:

1. be treated as experiments
2. address a challenge articulated by project participants in pilot sites and other institutional stakeholders
3. be publishing-oriented, addressing content profiling and dissemination through new tools and technologies
4. utilise open approaches (including open source software and publishing platforms) wherever possible
5. yield insights that could be extrapolated to the rest of the institution, developed in line with current institutional strategy, e-infrastructure and international standards and protocols around interoperability.

SCAP scoped and fulfilled the implementation initiatives during our four site visits to the institutions. The first visit aimed to surface the contradictions in the scholarly communication ecosystem, while the latter three visits sought to create consensus about the nature of the initiative, identify stakeholders and policy frameworks, and implement the agreed-upon pilot process.

While the formulation process was participatory, the principal investigation (PI) team played a considerable role in interpreting and translating the desires of informants into a feasible intervention. This was due to two factors. First, while informants had a clear sense of institutional challenges, they were often unable to articulate desired solutions to them because they were unaware of the new technologies that might overcome these challenges. Second, the PI team also had the responsibility of protecting the funder's interests and ensuring that the implementation activity adhered to OA principles.

In this chapter, we examine the process and results of our implementation initiatives at the four pilot sites. We do so by identifying scholarly communication challenges at each

site, determining the focus of our interventions, putting the initiatives into action and considering what lessons were learned through these engagements.

UB Department of Library and Information Studies

The Department of Library and Information Studies (DLIS) served as the SCAP pilot site for implementation activity at the University of Botswana (UB). This was located within the broader Faculty of Humanities (FoH) which served as our main research unit concerning scholarly communication practices (as discussed in Chapter 5). We chose to work with DLIS because the administration had identified it and its 18 faculty members as engaged with some of the issues in which we were interested.

When we contacted DLIS and the broader UB community through a series of presentations, workshops and interviews in early 2011, the institution showed signs of having engaged with the open access debate and of developing a strategic engagement with scholarly communication practice, infrastructure and policy. UB had already established the University of Botswana Research, Innovation and Scholarship Archive (UBRISA)[123] institutional repository (IR) in 2009 which had a content focus that was in line with the SCAP approach of profiling a broad range of scholarly outputs, including "journal articles (preprints and post-prints), conference and seminar papers, technical and research reports, books and book chapters, data sets, images and audio visual material, research lectures, PhD and masters theses and some 'special' archive collections" (UB 2008c: 5). Moreover, "all content will be made available on an open access [OA] basis unless there are specific reasons and circumstances necessitating the restriction of access to the full text" (UB 2008c: 5).

Complementing this e-infrastructure was a number of policies and guidelines that aimed to regulate and promote research communication activity. Many articulated the need to utilise dissemination as a means of addressing local development imperatives. The University Research Strategy (UB 2008c: 6) states:

> A new emphasis will be given to the impact of research on the wider society and the goal of ensuring that research has tangible public benefits, so that wherever possible new knowledge is turned into action, innovation, products or services. Thus encouragement and incentives will be given to research proposals that clearly specify how dissemination and application will be undertaken and impact achieved … The establishment of the digital research repository will provide scholarly access, visibility and usability to the University's research output.

Challenges

While UBRISA and a scholarly communication policy framework were in place, academics, librarians and managers expressed a number of concerns about the scholarly communication environment during SCAP's first site visit.

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123 UBRISA available at: www.ubrisa.ub.bw/

Quality

Key among these was the lack of publishing options and channels. At the time there were eight institutionally affiliated journals, of which many were published infrequently (once a year, or less) or were perceived by the staff as being of inconsistent quality. This concern for quality was central to SCAP's partnership with UB, and was even spelled out in the University Research Strategy (UB 2008c: 5) which states that, "The Office of Research and Development will continue to develop strategies for encouraging publication and promoting research quality assurance." Indeed, the UB Department Research and Publication Committee (DRPC) Terms of Reference (UB 2009a: 1) was issued as a response to this policy directive and articulated a process through which departmentally based committees would be formed to "facilitate and promote basic, strategic and applied research of the highest international quality within the Department." Two of the core functions of these committees included ensuring:

- peer review of proposals, research reports, conference travel and other outputs from the Department
- mechanisms for the approval and uploading of Departmental outputs onto the Digital Repository

But when SCAP started its engagement with UB, this process had never been put into action in any of the university departments. Because of this, many scholars reluctantly sent their research to be published outside Botswana because they felt that "at international level, quality is assured." They understood that this choice inadvertently reinforced the challenges of building quality into local publishing enterprises, with one lamenting that "we [UB academics] undermine our own excellence." Even worse, they sensed that this compromised the confidence that the government had in local research.

Open access

The UB pilot participants agreed that additional publication channels were required, leading them to favour the idea that SCAP's implementation initiative should focus on the development of an information management and library science journal within DLIS. One of the problems, however, was that not everyone agreed that such a journal should be open access, one of the key conditions of SCAP's engagement with the department.[124] While university managers tended to agree that "there is no doubt that open access is the way to go," DLIS academics were more cautious and worried "that they will be giving their knowledge away to the world" without any benefit accruing to themselves.

Resources

For the most part, academics felt that the UB library was well-resourced. But for the PI team – located at UCT – this high level of reported satisfaction with the university's library resources was difficult to reconcile with our knowledge that UB had only recently adopted the research mission[125] and that, compared to other, more established research

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124 This hesitation about open access is discussed in greater detail in Chapter 5 where it is revealed that 25% of our FoH survey respondents either disagreed with or were unconvinced of the merits of open access publishing.

125 The UB Research and Development Policy was articulated in 2002, but consists primarily of aspirational statements, not an operationlisable plan for achieving it. Only in 2008 was the more comprehensive University Research Strategy ratified by the UB Senate.

universities in the region, its resources appeared quite small. So why did the UB scholars think their library resources were adequate? During our research, survey responses and interviews revealed that most UB academics engage in interpretive or derivative research, meaning that they do not require vast amounts of empirical data, but can rely largely on secondary or review literature (and any other data that they may have gathered from earlier in their careers, such as through their PhD dissertation research). In this context, they considered their library holdings as adequate. However, it is likely that, over time, the level of resources will need to grow as scholars embark on more original, empirical research, in line with an enlarged research mission.

Gatekeeping

Many scholars and librarians also identified the main UB website as being inadequate for profiling content, existing more to serve the management's objectives than those of the academic staff members and students. Academics complained about gatekeeping practices that made it impossible for them to have any input into the content that appeared on the website, and as a result felt that it did not speak to their own profiling needs. In a global context where the internet is seen as the predominant mechanism for information exchange, the UB website was seen as limiting scholars' visibility.

Buy-in

Lastly, academics complained about UBRISA because of long lag periods between content submission and deposit. Though the IR had been operating for two years by the time of SCAP's first visit, it was struggling to achieve a critical mass of outputs because of mismanagement and scholars' resulting lack of buy-in. One senior academic claimed that the content she had submitted more than a year earlier had still not been uploaded onto the repository, nor had anyone bothered to acknowledge receipt of her item. Because of such experiences, the UB scholars we interviewed believed that they were justified in resisting this administrative initiative because they saw it as a marketing exercise by the management, not something that would provide the academics with any real benefits.

Implementation focus

DLIS participants suggested that SCAP's intervention should support the development of a new journal produced from within the department called *Infotrends: An International Journal of Information & Knowledge Management.* DLIS had published the first (print only) issue of *Infotrends* in 2011 just as the SCAP pilot scoping process was getting underway. Facing uncertainties around financial and editorial sustainability, DLIS hoped that the SCAP initiative could bolster the journal and give it an electronic presence. In the wake of the first site visit, the SCAP PI team explored various options for how it might utilise UB's Open Journal System (OJS) set-up and establish a workflow process that ported content directly into UBRISA upon publication. However, despite our shared enthusiasm for this proposal, it had to be abandoned when it later emerged that the journal was not recognised by UB's Office of Research and Development (ORD) on its official list of UB-accredited journals, the founding editor-in-chief had departed, and the journal had no business model or publication plan in place to proceed to a second issue.

We therefore recommended that our intervention focus on piloting a sustainable work-flow process incorporating quality assurance (QA), copyright clearance and uploading procedures so that more UB research could be profiled on the IR. This was in line with the UB Digital Repository Policy (UB 2009b: 8) which states that, "realisation of the UBRISA requires institution-wide effort, mainly at departmental levels where submission and management of collected research output will first occur. Ideally, senior academics should be appointed as collection manager(s) and reviewers(s) at each point of submission, which is the Department."

We proposed that DLIS select 20 research outputs from its faculty members to put through a process – involving QA, intellectual property clearance, repository deposit and content description/indexing – for uploading onto the repository.

To support the initiative, SCAP hired a South African-based libraries and metadata expert with experience in institutional knowledge management processes while the PI team drafted a QA workflow process that could be appropriated for pilot purposes. The resulting proposal was constituted by four phases.

Phase 1: Articulation of concept and gaining buy-in of institutional stakeholders

SCAP's institutional grant was utilised to bring on board a DLIS content coordinator (CC) to liaise with ORD, DLIS and UBRISA in order to coordinate the initiative locally. The CC was to get academics' buy-in to the initiative and ensure that the interests of all relevant parties were represented, and that institutional policies and protocols were adhered to. The CC was additionally responsible for articulating and managing the content workflow from submission through review and, ultimately, deposit in UBRISA.

Phase 2: Establishment of the DLIS Research and Publications Committee (DRPC)

It was proposed that DLIS establish its DRPC, as called for in the University Research Strategy Terms of Reference document. The DRPC was to be responsible for identifying the minimum 20 resources, putting them through a QA process and supporting the CC in liaising with authors.

Phase 3: Content initiative

The CC was to work with DLIS academics to identify 20 scholarly resources to go through the QA and IP-vetting process, as administered by the DRPC. The CC was to give regular feedback to the PI team so that it could monitor the results of the initiative and incorporate these changes into the final proposal given to UB which, it was hoped, would be scalable and implementable by other UB departments in the long term.

Phase 4: UBRISA deposit and metadata capture

Once content had been cleared for exposure on the IR, it would be published via the repository and the DLIS CC would work with the UBRISA manager, the PI team and the SCAP consultant in articulating a suitable process for future content deposit and description. In articulating this framework, there were three principal areas of concern:

- DLIS academics and managers might be reluctant to participate given the additional workload this process entailed and the fact that the previous proposal (to publish *Infotrends*) had been abandoned.
- The late proposal change might mean that our results were not meaningful due to a lack of time to pilot and monitor results.
- IP and third-party copyright considerations constituted a significant challenge in terms of sharing multiple genre outputs, requiring the DLIS pilot to follow best practice and adhere to local and national policy in this regard.

Despite these concerns, DLIS and the PI team embarked on the pilot initiative, the results of which are discussed below.

Implementing the initiative

Implementation activity was comprised of three steps: identifying resources for submission, the DRPC review process and the deposit of content to the UBRISA team.

Step 1: Identifying resources for submission

The DLIS pilot process got underway in October 2012 with the appointment of content coordinator (CC). He was a senior academic in the department, a former university librarian (at the main library and one of the satellite campuses), a regular participant in SCAP workshops and passionate about raising the visibility of DLIS research.

The UB CC started by requesting that the DLIS HoD circulate a memo to DLIS academics enjoining them to cooperate with the efforts of the CC and the SCAP initiative. He and the PI team understood early that it was important to involve the leadership structures in such initiatives if they were to be taken seriously by the academic staff. Thereafter, the CC embarked on a door-to-door campaign to engage the 18 members of the department in one-on-one meetings. This exercise generated the submission of 15 outputs: 11 journal articles with single or joint authorship and four reports or commissioned works. (This was fewer than the 20 outputs that we had originally hoped for, but due to time constraints, we agreed that 15 outputs would still be suitable for our purposes.)

Step 2: The DRCP content review process

The five-member DRPC then met in October 2012 to review the 15 resources, at which stage the CC briefed members on requirements of the pilot initiative and introduced them to the principles of SCAP's proposed QA process. According to this QA model, reviewers were asked to assess outputs according to three key criteria: methodological rigour, logical coherence and completeness. The process was meant to be transparent and light, with review duties done in rotation so that no one would be burdened in an unsustainable fashion.

The 15 pilot outputs went through a single review process (sometimes "blind", sometimes not, depending on the preference of the reviewer). Reviewer reports were sent to the CC, who then communicated their commentary to the authors. The PI team monitored this feedback process and found it to be thoughtful and robust, suggesting that

DRCP members saw this QA process as an opportunity to mentor some of the younger staff members through serious intellectual engagement.

However, in some cases, where the CC judged the comments to be too "blunt" (meaning that the tone communicated in the comments did not match the tone intended by the otherwise supportive reviewer), the CC used his discretion to "massage" some of the language of the comments so that the author did not feel attacked or upset by this (unremunerated) process. Though the PI team had not anticipated how important it would be for the process to be sensitive to authors' feelings, this ended up being crucial for one key reason: scholars were not obligated to participate in this QA process, thus if it to were to remain sustainable, they had to feel supported by it, not diminished.

In cases where a reviewer rejected an output for uploading, the output was to be sent to a second reviewer. Should the second reviewer also reject it, the authors would be given the opportunity to reassess it and resubmit it at a later date. But in cases where the second reviewer disagreed with the first reviewer (approving it for publication), the DRPC and CC would together make a decision about whether to submit the resource to UBRISA.

The collection and review process concluded in February 2013 with 15 outputs successfully reviewed – a significant achievement given the short time period. There were no cases of outright rejection, but where only minor revisions were required, authors made those revisions. However, due to the fact that no reward is given to those who publish their outputs in UBRISA, the authors of the two papers that required significant corrections did not bother to make them. Of the 15 outputs that were received, all but two were ready for submission by March 2013.

Step 3: Content deposit in UBRISA

Technically, this was where SCAP's implementation activity ended, with the delivery of quality-assured outputs to the UBRISA manager in the UB library. To that extent, the pilot implementation was a success. Unfortunately (as of time of writing), the final step in the actual deposit and uploading process – handled by the UBRISA management team in the library – had yet to occur. More than three months after the CC submitted the objects to the library, the outputs were still not uploaded onto UBRISA.

When the CC queried the library team why there seemed to be a delay, he received two different explanations. One was that UBRISA was "down" and that nothing could be uploaded onto the server. This indeed appeared to be the case at times, at least from the erratic presence the website had when SCAP periodically checked on it. On some occasions, the web page showed a "server error", suggesting technical difficulties. However, this appears not to have been a permanent state of affairs, but rather an occasional occurrence (similar to the periodic losses of electricity at the university).

Another library official offered a more revealing explanation, stating that s/he did not believe that it was appropriate to upload materials onto UBRISA that had "only" gone through a QA process run by the authors' immediate peers in their departments, suggesting that this might cause a conflict of interest and that it was not "blind" enough. Thus

s/he would not upload them until s/he had received approval from a higher authority than the CC and the DRPC. This response is revealing for four reasons:

- The librarian's statement directly contradicts the UBRISA workflow policy which identifies the department as the level at which an author's object gets quality assured, suggesting that s/he was either unfamiliar with these particular aspects of the policy or disagreed with them (UB 2008b).
- The librarian amplified his/her role as a UBRISA gatekeeper, withholding services based on a putative concern for quality that goes beyond his/her remit.
- Scholarly communication is not a politically neutral act. The library team has, for the last four years, been entrusted with identifying and "harvesting" UB scholars' journal articles and profiling them on UBRISA.[126] With the development of the QA process, in which departments are able to submit materials themselves, the importance of the library team would be correspondingly diminished. It would no longer control all facets of scholarly communication through UBRISA, but would be reduced to playing a more facilitative role. This power change is not insignificant.
- This exemplifies one of the key findings offered in this study about scholarly communication at UB, that while the university has made great progress in *articulating* useful scholarly communication policies, it has been less successful in *implementing* them, precisely because of disjunctures like this in what should be a coordinated process.

Unfortunately, experiences like this seriously erode UB scholars' confidence in UBRISA, making them want to avoid it. Many scholars expressed dissatisfaction with their interactions surrounding uploading materials to the IR, and this departmental experience appears to reinforce that perception.

Lessons learned

While this pilot initiative was located in a single academic department, the issues surfaced pertain to the entire institution, specifically as relates to the question of how to articulate institutional workflows for the profiling of a wide range of content outputs via an IR. Through this activity, SCAP was able to test a number of assumptions about QA workflow processes within the UB institutional context. The lessons that we learned about the process include the following:

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126 To start the process of populating UBRISA, the library team initially "harvested" UB scholars' articles from journal publishers' websites and then uploaded them onto the IR, but in a slightly altered format. Unfortunately, this harvesting process was inefficient (and legally problematic). It was inefficient because it required library staff to search online for scholars' outputs themselves rather than to rely on scholars to submit them themselves. It went against best practice because many of the outputs were saved in formats that did not allow for search engines to crawl the text and identify them during searches. And it was likely illegal because many of the articles went through a "scrubbing" process, in which UBRISA members downloaded UB scholars' articles from publishers' websites, photocopied them while blanking out the copyright information on the article, and then re-presented them on the IR as if they were open access files. This process was not based on negotiation with or permission from the publishers, but more on convenience for the library team. Given the lack of participation by UB scholars, the UBRISA team's actions were understandable, though not sustainable or desirable. The workflow process needs to be revised going forward.

Lesson 1: Because UB FoH scholars do not see the value that UBRISA brings to them directly (either through increased citations, financial reward, etc.), they feel virtually no incentive to submit their outputs to the IR. This sentiment also determines the amount of energy scholars are willing to expend in revising an article that has gone through a QA process: where small revisions are required, scholars are likely to make the effort; where large revisions are required, scholars will not bother to make them.

Lesson 2: Scholars must be given financial, temporal or symbolic incentives for consistently contributing their outputs to the IR. They must be rewarded not just for publication (as they are currently are), but for broader dissemination activity (that is, ensuring that their outputs are also profiled on the UB IR).

Lesson 3: Academic departments and faculties can serve as powerful and efficient quality assurance entities. For them to remain sustainable, the workloads of the CC and DRPC will have to be relatively light (given their other commitments) and incentivised (with either PMS points or financial rewards).

Lesson 4: The success of the DLIS QA process relied on the motivation and wisdom of the content coordinator, who not only spent significant time trying to obtain the requisite number of outputs to put through the pilot process, but ensured that the experience was a positive and supportive one for the participating scholars. This required substantial time, interest and knowledge of the departmental environment.

Lesson 5: The UBRISA management team does not have the time, resources, incentives or capacity (yet) to run the IR in an efficient and responsive manner. The UB administration has assumed that IR management activities could be simply added to librarians' other duties, thus underestimating the IR's temporal and capacity requirements. For UBRISA to live up to its potential, it will have to be overseen by a staff member for whom it is the top, or only, priority.

Lesson 6: Any intervention into a scholarly communication ecosystem is fraught with political consequences. Even if the initiative serves to enhance scholarly communication, it may positively or negatively affect various stakeholders' positions within that ecosystem, creating new obstacles and challenges.

Lesson 7: The QA process opens a space for structured mentoring between senior scholars on the DRPC review panel and the junior scholars submitting their outputs for review. This presents a major opportunity for the university to strengthen its research culture.

UCT Southern African Labour and Development Research Unit

While the Faculty of Commerce served as SCAP's research site at UCT, the Southern African Labour Development Research Unit (SALDRU) served as our pilot site for implementation activity. As a highly regarded independent research unit which draws its members largely from the Economics Department, it offers a unique vantage into a "mode 2" academic entity (Gibbons *et al.* 1994) within the university. It is one of many at UCT, thus we hoped that our engagement with it would offer insights of value

not only to other comparable units, but to other departments and faculties across the institution.

In 2010, SALDRU underwent an external review (one year prior to the SCAP engagement) in which one of the critiques levelled at it was that it lacked online visibility. While the unit had a well-designed and functional website, it was falling short in terms of detailed search functionality and ease of use in content navigation. SALDRU's problem of online "findability" was compounded by the fact that, as a research unit tasked with engaging government and civil society in the poverty alleviation debate, it produced a wide range of outputs besides journal articles and book chapters (content that would traditionally be available through publisher websites) that were largely invisible online.

Challenges

The unit identified three main areas of activity that they felt could improve their scholarly communication:

- *Make content more accessible*. SALDRU had a great deal of research output to its name, but it was not visible on the internet. Even on the unit's website, content was often difficult to find. An important sub-component identified within this was the need for standardised staff profile pages. At the time, some staff members had profiles while others did not; some also shared varying kinds of content via their profile pages but this content was not centrally curated and was therefore not searchable. The sharing of content appeared haphazard.
- *Produce more popular writing about the unit's research*. This was a particular challenge in the SALDRU structure given the diffuse nature of the unit and its egalitarian management style. There was thus an absence of hierarchy-based managerial entities that could function as the "official mouthpiece" of the unit. This made delivery of a cohesive "SALDRU perspective" on a policy issue a challenge.
- *Boost informal communication amongst the SALDRU community*. Given the unit's cyclical grant funding structure and fluctuating staff cohort, the unit required a more regular internal communication system so that staff could be kept aware of the work in which their colleagues were engaged.

These activities were identified as allowing the unit's work to have a greater public impact. Participants in the first SCAP workshops highlighted the fact that, even though they wanted the unit to have a stronger public impact, this objective was not even reflected in its mission statement. Participants felt that this would need to be incorporated into the formal mission to shape and reflect the scholarly communication strategy of the unit.

During our research, SALDRU was one of 71 UCT-affiliated research units conducting work in a wide range of often niche and inter-disciplinary areas. These units enjoyed varying levels of support from the university administration, and while those units situated on any of the UCT campuses would receive the standard IT service provision afforded to the rest of the university, few (if any) received any centralised support aimed

at addressing content curation and visibility. SALDRU's challenge was therefore not unique, but a shared feature of many units, departments and faculties.

This problem was made more acute by the fact that UCT did not have an IR at the time of the SCAP initiative. If it had had this type of infrastructure, it would have provided an avenue for units such as SALDRU to profile their work online. The absence of an IR was, however, not identified as an explicit challenge by SALDRU participants because they had for some time been profiling their research via the Research Papers in Economics (RePEc) site, an online content aggregator designed to enhance the dissemination of research in economics. In the minds of many SALDRU members, they already had a repository in RePEc, a fact which accorded with their own disciplines, norms and practices. This, combined with the fact that they hosted and administered their own website, meant that they did not look to centralised institutional e-infrastructure for scholarly communication opportunities.

Implementation focus

Based on the input of SALDRU members, the PI team proposed a pilot intervention process comprising three core objectives, to:

- improve content curation to address the findability of SALDRU resources via internet search engines and the unit's website
- establish a round-table forum for developing an organisational perspective on policy issues and experimenting with various methods for engaging with policy discourse in a more coordinated manner
- develop internal communication tools (with particular focus on the website and an electronic newsletter).

Increasing findability and visibility through improved content curation

In an investigation into the online visibility of South African poverty alleviation work, Czerniewicz and Wiens (2013) found that much of it was comparatively invisible because it lacked metadata and IR connection that the more visible work enjoyed. This exemplified the importance of the relationship between research, publication, content curation and social development.

Our preliminary investigation indicated that there was a significant amount of SALDRU content online, but that it was hosted in disparate locations and poorly indexed. Thus, SCAP resources were utilised to bring a part-time content architect from UCT's Digital Libraries Laboratory (a postgraduate research unit in the Computer Science department) to function as an intermediary in translating the desires of the community, assess the affordances of current e-infrastructure and work with SALDRU stakeholders to implement new curatorial systems and processes. The content architect would also be tasked with ensuring that systems were as open and interoperable as possible.

This desire for interoperability not only revolved around linkages to international content aggregators and indexing services, but to institutional e-infrastructure and content services. SCAP saw itself as having an important role in brokering this improved cohesion, as SALDRU members appeared disenchanted with institutional systems

(according to their statements in the change laboratory workshops) and were reluctant to pursue any strategy that would make them beholden to institutional systems, particularly with regards to IT service provision.

Despite this legacy of disenchantment based on prior experience, SCAP re-opened the dialogue between SALDRU and the central ICT services based on the notion that the preservation and sharing of content via secure, institution-based infrastructure that could then be linked and shared elsewhere was preferable to the investment in building content collections with third-party organisations. The issue of depositing content in external or discipline-specific repositories such as RePEc would therefore be examined.

Intervention: OpenSALDRU

With the above objectives in mind, the SALDRU content architect was brought on board to conduct a situational analysis, to provide content description and indexing and to explore mechanisms for content profiling via the new content curation system.

Phase 1: Situational analysis

Because SALDRU had already been producing a wide range of outputs for over 20 years by the time SCAP engaged with it, it had accumulated a number of curatorial systems and e-infrastructure mechanisms to handle these outputs. There had been no prior imperative to deal with this strategically, therefore these systems had been developed in piecemeal fashion over the years, with certain areas functioning better than others. The presence of existing systems had the potential to be a positive factor in that legacy systems could serve as a foundation for new tools and operational systems; it could also prove to be a hindrance in that user communities might be invested in previous systems out of habit, making them reluctant to move to new systems, despite their benefits. As much as possible, SCAP wanted the pilot initiative to leverage the affordances of existing systems and e-infrastructure, and also to work with current stakeholders invested in those systems so that they felt a sense of ownership in the new process. The buy-in of the SALDRU community was seen as crucial in terms of ensuring that this remained sustainable beyond the duration of the SCAP intervention.

Our situational analysis revealed that the SALDRU website was run from the Joomla platform integrating a document archive (DocMan) that was used to store, manage and facilitate access to research publications. Five critical shortcomings were identified:

- Inconsistencies in how representational information was presented for collections
- Lack of use of controlled vocabulary for metadata elements such as author details and publication date (which generally led to inconsistencies on the front end)
- Absence of interoperability. Other than integration with RePEc, there appeared to be no provision for other machine-to-machine interoperability mechanisms such as the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)
- Insufficient metadata exposure. Important metadata elements such as author details were being embedded as hypertext mark-up language (HTML) elements rather than data in discreet fields. This would generally make it difficult to implement a browse feature

- Inadequate information discovery tools. Specifically, the search features associated with the website were rudimentary, and the lack of a corresponding browse feature limited the ease of finding information.

The purpose of the situational analysis was to derive a set of recommendations and a process for addressing Phase 2, content curation. But in order to proceed, we had to decide which content platform to use. The Joomla platform that was being utilised by SALDRU was a content management system (CMS), a tool for web-based content curation and sharing. But SALDRU's research-specific needs called for more control around metadata and preservation, which we thought was better handled by a DSpace repository system. DSpace is a free and open source repository platform that is currently regarded as the industry standard in repository software. We arrived at this determination after the content architect evaluated the suitability of the CMS (Joomla) versus the repository (DSpace) approach.

Table 6.1 Comparison of CMS vs repository benefit for SALDRU content curation

Feature/Attribute	Repository (DSpace)	CMS (Joomla Plugin)
Interoperability	OAI-PMH, OpenSearch, RSS, SWORD	Limited via RSS feeds
Metadata management	Flexible and comprehensive metadata scheme(s)	Limited metadata elements
Preservation	Standards-based metadata schemes	Free-form descriptive metadata
Resource discovery	Advance searching and browsing, with faceted features	Basic search available

Based on the outcomes of the evaluation exercise and consultation with institutional stakeholders, curation experts and SALDRU, our situational analysis concluded with a decision to invest in a repository-based system for the implementation initiative. Thus we started by replacing the Joomla CMS with a DSpace repository.

Phase 2: Content description and indexing

A significant amount of pilot activity was spent building the SALDRU DSpace installation. While its development can be undertaken in a matter of days or weeks, the process of engaging with SALDRU in its conceptualisation and design so that it reflected the nature and structure of the unit's work, was time-consuming. We decided that, while the DSpace instance would remain on local hosting infrastructure operated by SALDRU-appointed staff, its development would take place in line with institutional systems and policies. This was to ensure maximum interoperability with institution-based visibility-enhancing initiatives.

Phase 3: Explore mechanisms for content profiling

Once the DSpace platform was installed, the content architect consulted with SALDRU to develop a comprehensive set of metadata elements that would be used to identify the digital objects. This was done in line with the *Journal of Economic Literature* (JEL) classification codes used by RePEc and other economics content aggregators. This was important for maintaining interoperability with the RePEc portal and operating within disciplinary norms and standards pertaining to content curation. Following an extensive consultative process to articulate the metadata schema, content deposit could begin.

The process culminated in the launch of the OpenSALDRU[127] DSpace 1.8.2 repository in April 2013. At the time of writing, Apache Tomcat 6.0 was being used as the Servlet Engine, with PostgreSQL as the back-end database management system. The content architect based the site's appearance on the Mirage theme ("Mirage Configuration and Customisation") in collaboration with SALDRU content curation staff.

Intervention: Round-table policy forum

The first change laboratory workshop identified that the unit wanted to produce popular writing about its research in order to access policymakers and non-academic audiences, and to be able to develop consolidated policy perspectives for sharing with the public. As a first step in achieving these objectives, it was proposed that SCAP pilot activity incorporate a trial of a round-table forum on a pertinent issue on which there was a need for policy discourse. It was suggested that this process be piloted by choosing a topic central to the current SALDRU research agenda, aggregating results from the research it has produced in this area, deriving conclusions, producing policy recommendations (if necessary), and writing something in the form of a policy brief or press release.

Subsequently, the SCAP research coordinator facilitated further exploration of the concept by identifying the topic of teen pregnancy as a focus for the process. This would be undertaken in collaboration with a scientific writer who would participate in the round-table and produce a series of outputs in line with a SALDRU brief. The writer would ideally have familiarity with the subject and policy environment, though not be a SALDRU member.

Table 6.2 Phases in the SALDRU pilot round-table process

Activity	Description
1. Constitute a working group of SALDRU specialists in subject area	Research coordinator identifies stakeholder in the SALDRU community and invites participation.
2. Bring writer on board	SALDRU research coordinator identifies writer, briefs and commissions work.
3. First round of consultative interviews	Writer interviews working group for foundational perspective.
4. Round-table logistics finalised	• Date set • Panel convened • Venue arranged
5. Round-table meeting held	Closed, three-hour event, recorded for transcription.
6. Writer produces report proposing outputs (ideally to include press release, popular media article, policy brief, op-ed)	These ideally to include: • Conclusions of round-table forum • Policy recommendations
7. Outputs prepared	Syndication of outputs to produce a suite of materials for articulated purpose/audience.
8. Outputs used as trial	Showcases range of outputs on website in line with developments taking place in parallel stream of SCAP activity.

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127 OpenSALDRU Repository, available at: http://opensaldru.uct.ac.za

The round-table process was initiated in November 2011 and completed by mid-January 2012. The final output was a policy brief called "Revisiting the 'crisis' in teen pregnancy: What is the impact of teen births on young mothers and their children?"[128] The process was completed with the assistance of an external team comprised of a scientific writer and designer based at another UCT-affiliated research unit – the Children's Institute – who had experience in producing policy briefs. Their expertise was central to the speedy completion of the exercise and the professional nature of the end product.

This activity represented a first layer of exploratory activity, with the feasibility and value of the endeavour being evaluated for case study purposes. While it was the unit's ambition that fora such as these be replicated in the future, the primary value of this foray was to track what resources were required and identify factors influencing success or failure in this domain. There are other areas that will need to be explored in order for the unit to further its experimentation with the popularisation of its research.

Intervention: Internal communication tools

Many SALDRU members noted to us that the unit's large, distributed, inter-disciplinary staff contingent made for a highly dynamic group, but one whose members struggled to communicate with each other regarding day-to-day SALDRU activity and research interest. Because of this, the unit proposed that SCAP pilot activity incorporate exploration of internal communication tools to enhance internal communication, specifically through an electronic newsletter. It was hoped that the newsletter could also play a marketing role and provide a means of communicating with the broader SALDRU community.

Lessons learned

While this pilot initiative was located in a single academic unit, the issues surfaced pertain to the multiple areas of the institution, specifically as relates to the question of how to articulate institutional workflows for the profiling of a range of content outputs via a unit-level content repository. The lessons that we learned about the process include the following:

Lesson 1: Because SALDRU has been producing a wide range of outputs for more than two decades, it has accumulated a number of curatorial systems and e-infrastructure mechanisms to handle them. Since there has been no prior imperative to deal with this strategically, these systems have been developed in a piecemeal fashion, with certain areas functioning better than others. Enhancing the visibility all of those outputs going forwards requires that they fall under a single, cohesive strategic curation and profiling system.

Lesson 2: In the absence of an institutional scholarly communication policy or platform, this pilot demonstrates the possibility of promoting decentralised dissemination models while providing an indication of the personnel investment required. In SALDRU's case, this called for the creation of a communications officer position.

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128 Menendez A, Branson N, Lam D, Ardington C & Leibbrandt M (2011) Revisiting the 'crisis' in teen births: What is the impact of teen births on young mothers and their children? SALDRU Policy Brief, available at: http://opensaldru.uct.ac.za/handle/11090/7

Lesson 3: Research entities require significant internal capacity and careful coordination with institutional technical support staff in order to ensure that their communication activities adhere to institutional requirements and best practice. (This includes linking OpenSALDRU to other content-aggregating spaces and institutional e-infrastructure.)

Lesson 4: Most academics – including those at SALDRU – have varying levels of familiarity with new scholarly communication tools, technologies and practices (such as DSpace repositories), but they generally do not have the time or expertise to explore, evaluate and utilise them in a fashion that would optimise their dissemination activities. This requires specialists (such as content architects) who can advise and establish such technologies while training specific in-house staff members (such as communications officers) to maintain them.

Lesson 5: Third-party intermediaries can play an important role in helping academic entities to define a strategic approach to scholarly communication activity. Members of the SCAP team played this role at SALDRU, demonstrating the importance of engaging with the desires of the community (manifest in statements such as "we want a functioning website" and "we want our content to be findable online") and translating those into workable plans addressing content curation and scholarly communication activity.

UoM Faculty of Science

The Faculty of Science (FoS) served as the SCAP pilot site at UoM. It has consistently been one of the more prolific research-producing entities within the university, which itself is the most prolific research producer in the country. We hoped that an intervention promoting research visibility in one of the more productive faculties in the institution would provide an example to other faculties and units, promoting general visibility of Mauritian scholarship. Through our early change laboratory workshops, surveys, interviews and conversations at UoM, we aimed to establish what the primary scholarly communication desires and challenges within the faculty were. These would help us to determine the implementation initiative that we planned to pilot with FoS.

Challenges

During our research, we found that three challenges stood out for FoS members: collaboration, networks and profiles; low bandwidth levels; and low levels of existing dissemination activity.

Collaboration, networks and profiles

As discussed in Chapter 4, the Mauritian government aims for the island to become a "knowledge hub" in the region, a space characterised by dense collaboration and networking activities. This desire – which requires substantial investment in ICT – matches that of the university and FoS scholars. They recognise that virtual collaboration has become an academic norm through the globalisation of communication networks (Monge & Contractor 2003) and is crucial for future research activity in Mauritius (see Figures 6.1 and 6.2) where low numbers of scientific specialists require that they look beyond their borders for collaborative partners.
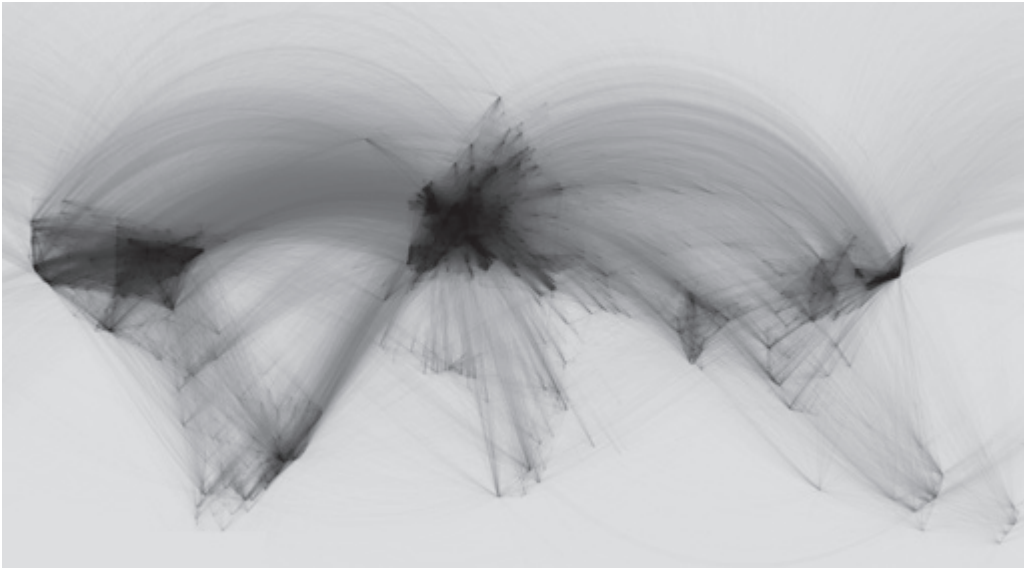
Figure 6.1 Scientific collaboration – global perspective (Beauschesne 2011)[129]
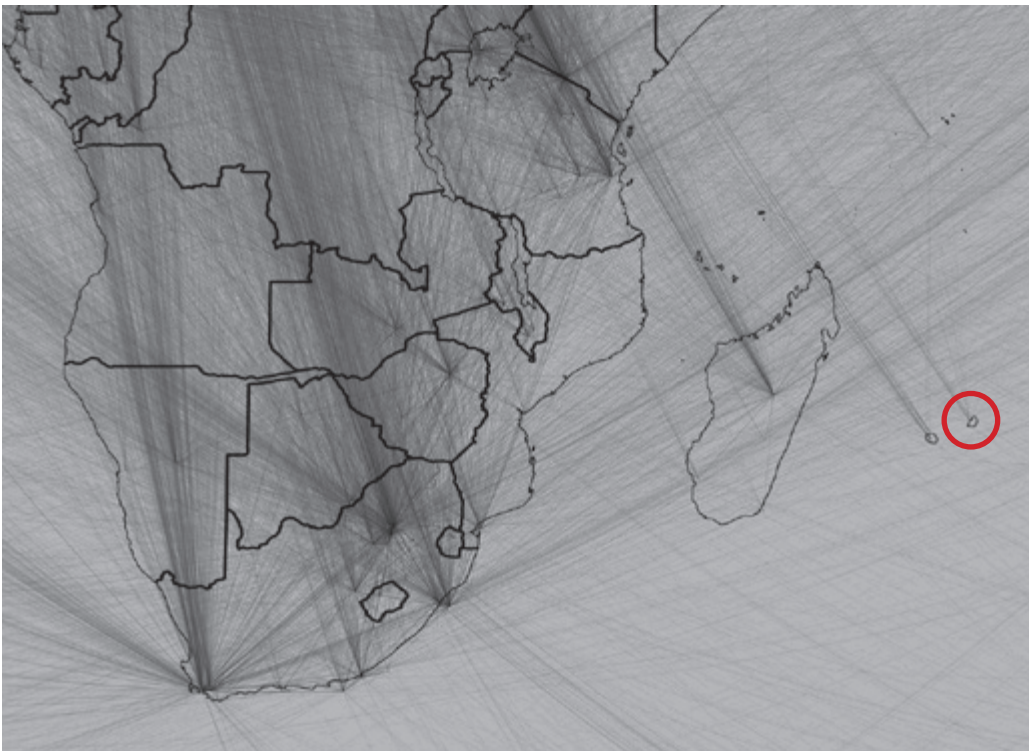
Figure 6.2 Scientific collaboration – Mauritius in perspective (Beauschesne 2011)[130]

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129 Based on data compiled by Olivier Beauchesne who aggregated scientific collaboration between cities from 2005–2009 using the Elsevier bibliographic database. Olivier Beauchesne (2011) Map of scientific collaboration between researchers. http://olihb.com/2011/01/23/map-of-scientific-collaboration-between-researchers/
130 Ibid.

To be clear, collaboration occurs across *networks* of two or more people and, increasingly, is *virtually conducted* rather than face-to-face. This bears particular relevance for Mauritian scholars, given their geographic isolation and low funding for international travel. However, entry into a network is not always guaranteed or automatic; and networks are typically subject to the dynamics of the status and power relations of their constituents. The chances of gaining access to a network are typically increased if the aspiring entrant has something to offer/exchange (either to other constituents in the network or to the network itself) and if the aspiring entrant can provide tangible, verifiable credentials to confer his or her perceived value to the network (often expressed as "social capital" in the theory of social networks) (Bourdieu 1985; Lin 2001; Portes 1998).

From an academic point of view, there are five types of academic communication networks that are likely to be pursued for collaborative purposes:

1. *Academic networks*: scholar-to-scholar, for the purposes of knowledge sharing and creation.
2. *Academic–industry networks*: scholar-to-industrial partner, for the purposes of knowledge creation in the form of innovation.
3. *Academic-government networks*: scholar-to-government personnel, for the purposes of policy and development.
4. *Academic-civil society networks*: scholar-to-community, for the purposes of advocacy and development.
5. *Funding networks*: scholar-to-potential research funder (e.g. philanthropies, science councils, and national and supra-national agencies), for the purpose of initiating research projects.

Given the importance of collaboration to FoS scholars – many of whom need to collaborate with overseas scholars in order to share and compare data in their specialised fields – SCAP believed that an academic profiling exercise aimed at increasing their online visibility would assist scholars in finding collaborative partners in international research institutions, and in so doing enhance the possibility of accessing international scholarly networks. Once a network had been joined, it was hoped, academics participating in the proposed intervention would be able to collaborate more frequently and effectively with other regional and international researchers.

Limits on broadband connectivity

When SCAP initially engaged with UoM scholars, many complained about the low bandwidth that then prevailed on the island, jeopardising their research prospects and hindering the nation's desire to move towards a "knowledge economy". This situation improved during our three years of partnering with UoM, but the island's comparative bandwidth capacities still remain an issue if UoM is going to leverage its research for developmental gain. The Mauritian government reports that the ICT sector in Mauritius, until recently a nascent industry, is now the third pillar of the Mauritian economy with a GDP contribution nearing 6.8%, a turnover of USD1 billion and directly employing more than 16,000 people.[131]

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131 Mauritius Ministry of Information and Communication Technology, ICT sector, available at: http://mict.gov.mu/English/AboutUs/Pages/ICT-Sector.aspx

In order to assess a typical telecommunications network, it can be divided into four parts: (1) international connectivity (typically via fibre-optic cable or satellite); (2) national connectivity (also referred to as the "backbone"); (3) the access network or "last mile" connection; and (4) the organisational network (in this case the on-campus network at the University of Mauritius) (Twinomugisha 2010).

In terms of international connectivity, Mauritius compares favourably with its SADC peers in terms of upload and download speeds (Figure 6.3).[132] However, it compares negatively to developed countries that have invested in the knowledge economy as a driver of growth and prosperity (e.g. Finland's average download speed in kbps in February 2012 was 13 times faster than that of Mauritius). Furthermore, Mauritius as an island nation remains dependent on a single cable for its international connectivity in the form of the South Africa Far East (SAFE/SAT-3) cable (see Figure 6.4).[133] This means limited international network redundancy because of the dependence on a single cable for connectivity.

Figure 6.3 Comparative international download speeds (kbps), January 2012[134]

In terms of the national backbone and last-mile connectivity, the Mauritian telecommunications sector is a duopoly of Orange (a subsidiary of Mauritius Telecom) and Emtel. Both offer 3G and ADSL connectivity to their customers.

132 See Ookla internet speedtest, available at: www.ookla.com/
133 The Lower Indian Ocean Network (LION) cable owned and operated by France Telecom-Orange (and its subsidiaries) connects Madagascar, Reunion and Mauritius, but still relies on the SAFE cable for global connectivity beyond the three island nations. LION-2 is planned for Q2 of 2012 and will link Mauritius to the EASSy cable network which makes landfall in Kenya. See: www.cablemap.info/
134 Source: Data from Net Index by Ookla, created on Google Public Data website, available at: www.google.com/publicdata/
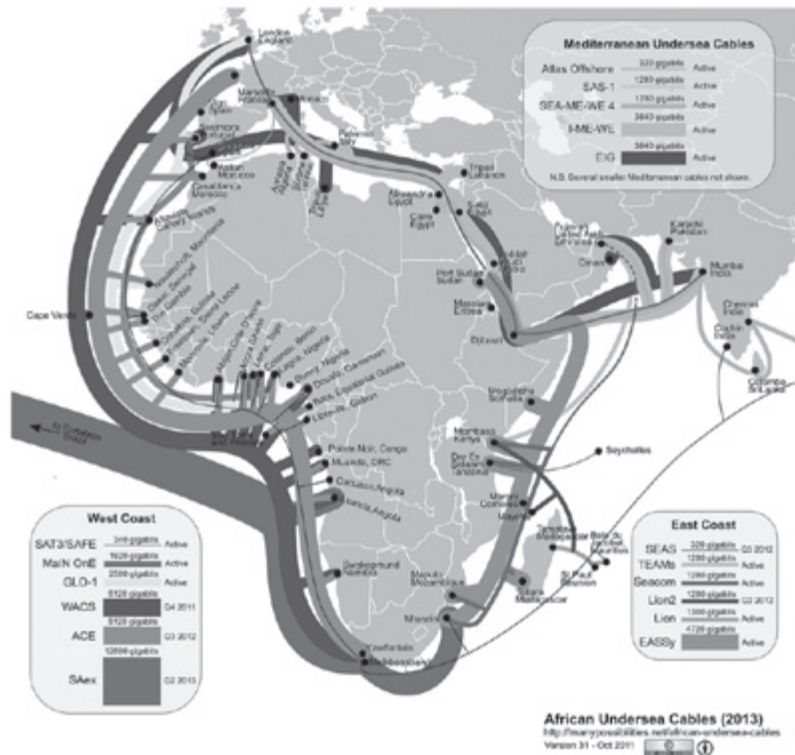
Figure 6.4 African undersea cables present and planned to 2013[135]

FoS scholars told us that, despite favourable access speeds compared to SADC peers, connectivity was not optimal at the institutional network level. The lack of computational power and limited on-campus internet broadband pose major obstacles at the university. In particular, the state of e-infrastructure inhibits collaborative research and causes delays in the production and dissemination of scholarly output. UoM's connectivity issues were especially pressing for researchers involved in high-performance computing and other intensive data-sharing research activity, common to the sciences. Some scholars indicated that they preferred to use their own personal internet connections for part of their work, due to the frustrating slowness of UoM's network.

Given the current duopoly in the Mauritian telecoms sector and the country's current dependency on the SAFE cable, what is encouraging is the Mauritian government's commitment (at least at policy level as expressed in its National Broadband Policy 2012–2020) to "to facilitate the provision of affordable, accessible, universal access to broadband infrastructure and services to promote the social and economic opportunities made available by broadband in order to ensure the best possible conditions under which Mauritius can grow further as a knowledge-based society" (Government of Mauritius 2012: 28). What is less encouraging is the absence of any policy goals to increase access at tertiary institutions – the policy document makes mention of policy goals in this regard

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135 Steve Song (2011) African Undersea Cables in 2013, available at: www.flickr.com/photos/ssong/6220166808/in/set-72157625051406818. For continuous updates on the state of African undersea cables, see: http://manypossibilities.net/african-undersea-cables/

at primary and secondary schools but seems to restrict the role of tertiary education to training ICT professionals. This correlates with the claims of the Mauritian government's limited spending on infrastructural development at the University of Mauritius (Bailey, Cloete & Pillay 2011).

Low levels of existing dissemination activity

The faculty contained a number of internationally collaborative academics, many of them specialists in their fields. Due to the low absolute number of researchers and their divergent academic portfolios, an individual specialist would often be the only local expert in her or his field. Thus, collaborative networks, especially with researchers from Europe, America and India, were both desirable and necessary for academic workflow, especially with regard to multi-authored research publication, a norm in many scientific fields.

During our first change laboratory workshop, many FoS scholars questioned the value of open access publication practices because they believed they had personally been well-served by traditional scholarly communication activities. A number of scholars were already publishing in high-Impact Factor journals in collaboration with international experts. This was reinforced by the institutional performance assessment system which rewarded international publication more highly than local publishing channels (such as the *University of Mauritius Research Journal*).[136]

However, due to the disciplinary norms of some science fields, many scholars were already engaged in open sharing. They had deposited their papers in subject repositories such as arXiv[137] or were engaged in large-scale data sharing as, for example, astronomers. Thus, research and information-sharing had been a part of certain faculty members' scholarly practice prior to the implementation initiative, though they had not identified it with an OA ethic.

Implementation focus

During our first change lab in May 2011, FoS participants identified five possible areas of focus for an implementation initiative:

1. Proposing a new system for valuing research
2. Profiling research
3. Producing scholarly outputs for the broader public
4. Facilitating the development of a regional publisher
5. Developing a virtual research collaboration platform

At the heart of these proposals appeared to be a desire to remove some of the barriers created by Mauritius's isolated geographic location and to ramp up the extent to which regional and international collaboration with other researchers occurs.

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136 *Research Journal of the University of Mauritius*, available at: http://vcampus.uom.ac.mu/rci/resjournal/. The journal's website refers to it as the *Research Journal of the University of Mauritius* and the *University of Mauritius Research Journal*, using both titles interchangeably. We have done the same here in this study.

137 arXiv.org e-Print archive, available at: http://arxiv.org/

Thus, we initially explored the prospect of establishing a virtual research environment (VRE) as a technological intervention. This was seen as a useful way to support scientific collaboration in the institution, both locally and nationally. We researched the prospects of installing a VRE and consulted a number of experts in this regard. We then engaged with the UoM ICT director and his colleagues on implementing a VRE, but it soon became clear that this intervention would be beyond the scope, feasibility and time frame of the project for the following reasons: there was no existing VRE expertise at UoM; the SCAP PI team did not have any prior experience with VREs; and VRE solutions are discipline-specific, meaning that it would not benefit the entire faculty, just certain departments.

We continued to explore other possibilities for addressing the needs expressed by FoS participants, and after further consultation with FoS members, we decided to implement a scholarly profiling initiative to facilitate greater international collaboration for the scholars, answering one of their key desires.

The Profiling Academics Online (PAO) initiative

SCAP's intervention focused on improving the visibility of participating FoS academics by enhancing their personal online profiles. The intervention therefore focused on profiling individual scholars and their research activities rather than the entire faculty. We did this, in part, due to the belief that empowering individual academics would facilitate a "bottom-up" scholarly communication engagement that would avoid straining the university's administration. We assumed that the institution would receive an indirect benefit from the increased visibility of its academics. In the long-term, we hoped that scholars with active online presences would be able to serve as models of networked scientific practice and act as local sources of expertise for helping other scholars to develop their own online presence.

The Profiling Academics Online (PAO)[138] initiative recommended that scholars engage with a suite of free online tools to enhance their personal visibility by creating personal academic profiles, using social media to engage with global scholarly discourse and to list their scholarly outputs. The following tools were selected based on their popularity and functionality within the international academic community, of which we asked FoS academics to those that they felt were most appropriate for their goals:

- *Mendeley* – a free reference manager and social network platform that assists academics in organising their research, collaborating with others online and discovering the latest research. Intervention: create a Mendeley profile and list all academic outputs.
- *Google Scholar* – the de facto online search engine for academic articles. Intervention: ensure that articles appear in Google Scholar search results and improve the rankings of these articles.

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138 Francois van Schalkwyk (2012) Profiling Academics Online (PAO) Toolkit, available at: www.slideshare.net/scap_uct/pao-scap-toolkit

- *LinkedIn* – a networking platform for over 225 million professionals worldwide. Intervention: create a LinkedIn profile and list academic outputs as well as awards and achievements.
- *ResearchGate* – a professional network of researchers and scientists consisting of three million members. Intervention: create a ResearchGate profile and use the tools available to foster collaboration with other scientists.
- *Slideshare* – a website for sharing presentations, documents and videos.
- *Academia.edu* – a platform for academics to share research papers. Over 4.6 million scholars use Academia.edu to share their research, monitor analytics around the impact of their research and track the research of academics they follow. Intervention: create an Academia.edu profile and use the tools available to foster collaboration with other scholars (if this is more suitable than ResearchGate).
- *About.me*, *Wordpress* or similar – a simple, self-managed web page that will profile academics and act as a gateway to their other online profiles. Intervention: create a personal web page to list publications and describe research interests.
- Any other *new online technologies* that may emerge during the course of the project or to which the project participants may introduce the SCAP research team.
- *Social media* – sites such as Facebook, MySpace and Twitter allow scholars to reach out to other scholars at a social level and "push" their research through status updates, comments, likes, shares and tweets. Blogs also offer a similar potential, though requiring a greater investment in time.
- *Publications and other academic output* – integral to any academic's profile are the "traditional" publications they produce, be they books, book chapters, journal articles, conference papers or professional articles. In addition, SCAP acknowledges the potential value of other outputs: datasets, laboratory notes, interviews, creative works, etc.[139] Inevitably, therefore, creating a more visible online profile of any academic will entail introducing him or her to new online publishing channels in order to provide links from his or her profile to these academic outputs.

Due to capacity constraints – specifically the absence of an embedded scholarly communication professional in the institution – the PAO initiative was designed to accommodate no more than ten participants from the FoS. The research assistant attached to the UoM SCAP team acted as the primary agent in this process, supporting academics in the creation of their online profiles.

Phase 1: Articulation of concept and gaining buy-in of institutional stakeholders

During the third site visit in May 2012, FoS staff were invited to a seminar in which they were briefed on Web 2.0 technologies, open access concepts and practices and new forms of measuring scholarly impact.[140] They were then introduced to the PAO initiative, and volunteers were requested from the change laboratory participants. Ten members of the faculty signed up to participate.[141] A ten-step process was developed in conjunction

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139 We suggested that if scholars lacked a platform for profiling their research outputs, they could use the free online service Figshare: www.figshare.com

140 Francois van Schalkwyk, presentation on tools and technologies for developing online academic profiles at the University of Mauritius, 8 May 2012, available at: www.slideshare.net/scap_uct/profiling-academics-online-12982575

141 The initial group of ten dropped to nine after one participant left the university. This group still constituted close to 20% of the FoS staff, however, and contained academics who were relatively active in publication compared to the faculty average.

with an external consultant, of which the first four steps were mandatory. They were also informed that the local RA would be available to assist them in the process of creating and maintaining their online profiles. The initial step in this process was providing an up-to-date curriculum vitae (CV) to the PI team and RA to serve as a reference document for uploading content to the appropriate platforms. Participants were asked to complete their profiles by the end of June 2012, and to update them and add content as regularly as was feasible.

Phase 2: Creation of online profiles and collection of baseline visibility metrics

The second phase of the programme began after the third site visit, in which the PAO consultant conducted an assessment of the existing online visibility of participants. This data was used as a baseline to help to track the progress of the initiative in improving visibility. The information was gathered via desk review during July and August 2012. Included in the baseline assessment were:

- the existence of a personal page on the university website
- existing profiles on LinkedIn, Google Scholar, Mendeley, ResearchGate, Academia.edu and other discipline-specific online platforms
- the existence of a personal web page or blog
- the number of publications indexed by Microsoft Academic and Google Scholar
- the existence of a Twitter account
- participants' position in the results of a Google search of their name and of keywords describing their field of expertise
- h-index scores and number of citations as calculated by Google Scholar and Microsoft Academic.

In December 2012 a second assessment was conducted using the same criteria as in the baseline evaluation in order to establish a change in each participant's online visibility. In addition to recording whether a participant had a profile on a particular platform, the December assessment also sought to measure whether there was any online activity during the six-month period.

Phase 3: Presentation of findings to FoS

During the final site visit in January 2013, the findings of the PAO initiative were relayed to FoS participants during the final workshop. At the same time, follow-up interviews were conducted with a selection of PAO participants as well as with some faculty members who attended the seminars but who did not participate in the PAO initiative.

Implementation initiative results

At the end of the programme, academics showed the greatest activity on LinkedIn (75%), ResearchGate (75%) and Google Scholar (66%). There was little to no engagement with Academia.edu, Twitter, departmental websites, personal web pages or blogs.

Four of the most prolifically published scholars were selected to assess the extent to which their publications were listed online and whether an increase in the listing of their publications (combined with their online profiles) led to an increase in their h-index

scores and number of citations. The determination of which four academics to include in this analysis was done based on the publication lists submitted by the participants to the PI team. Analysis through Google Scholar and Microsoft's academic platform, tools capable of tracking citations and *h*-index scores by academic, showed an increase in both counts for participating academics.

The scholars who volunteered for the PAO initiative were not proactive about creating their own online profiles. While an explanatory guide on electronic profiling was produced for their use, scholars were slower than expected in sharing their CVs and creating their own accounts. Numerous follow-up visits by the UoM RA were required for movement in this area. Time constraints were the only reason listed for the slow activity; at no point did participants express discouragement with the new technologies or find them difficult to navigate. When publication lists were acquired, they were typically incomplete, especially with regard to URLs and DOIs for online publication. This speaks to the inadequacy of current personal curation systems.

Scholars were selective in developing online profiles that spoke to a specific, identified need. For instance, participants created and maintained profiles on ResearchGate with far greater interest than on Academia.edu. This was due to the fact that ResearchGate appeared to cater better to the scientific community, with a proportionally greater representation of researchers in biology, chemistry and medicine whereas Academia.edu appeared better suited to those in the humanities and social sciences.

Lessons learned

SCAP was able to test a number of assumptions through this implementation initiative and yield important insights regarding the UoM FoS approach to scholarly communication. These include:

Lesson 1: Open access initiatives must work to develop a comprehensive understanding of a target site's historical and contemporary research activity before beginning open access advocacy. This is especially important in the case of small, geographically isolated or otherwise marginal institutions.

Lesson 2: Disciplinary communication practices strongly influence scholars' response to external stimuli (Reale & Seeber 2010) and may shape academics' behaviour even more strongly than institutional communication policies or strategies (as was the case with FoS academics).

Lesson 3: Not all academics are familiar with the concept of social profiling, nor are they necessarily proactive in developing their online presence. Thus it is advisable for intervention projects to embed capacity in the form of a content officer – such as a graduate student or IT-skilled personnel – who can assist scholars with this process.

Lesson 4: FoS academics find greater value in aiming their communicative activity at colleagues in related fields (through ResearchGate) than to the general public (through the UoM website) or non-discipline colleagues (through Academia.edu). This was

reinforced by their complete disinterest in blogs, personal web pages and Twitter – tools for mass (rather than directed) communication.

Lesson 5: e-Infrastructure constraints are not barriers to social media uptake. FoS scholars never cited inadequate bandwidth as an obstacle to engagement with online profiling tools which require very little bandwidth.

Lesson 6: Visibility is less important for FoS academics than networks. While participants were interested in collaborating and sharing with their peers, they were less concerned with the more abstract notion of visibility. Profiling platforms were not seen only in terms of their ability to promote visibility, but more as new paths for targeted collaboration or problem-solving. Furthermore, academics did not have an intuitive grasp of how to leverage their online profiles to maximise visibility (such as including high-impact key words to raise their page rank according to a given search string).

UNAM Faculty of Humanities and Social Sciences

The Faculty of Humanities and Social Sciences (FHSS) served as the SCAP pilot site for implementation activity at UNAM. It also served as our main research unit concerning scholarly communication practices (as discussed in Chapter 5). We chose to work with FHSS because it was nominated by UNAM in the light of the fact that the SCAP research coordinator was also the dean of the faculty.

The FHSS was ideally placed to contribute to SCAP's desire to showcase a range of outputs due to its production and existing profiling of a range of different scholarly outputs (journal articles, reports, videos, etc.). The developmental focus of much of its work was an additional motivating factor in collaborating with the faculty.

Challenges

Through our early change laboratory workshops, surveys, interviews and conversations at UNAM, we aimed to establish the primary scholarly communication desires and challenges within the FHSS. These were to help us determine the specifics of the implementation initiative that we planned to pilot with the faculty. During our research, we found that three challenges stood out for FHSS members: the young age of the institution; the absence of a policy regulating scholarly communications activity; and the fact that a previous IR installation had failed.

Age of the institution

UNAM is a relatively young institution, having only recently (September 2012) celebrated its 20th anniversary. Since its inception, its activities have largely been structured by a strong teaching mission. This sensibility was reinforced with the university's merger with the country's four teacher training colleges. The university absorbed the teaching staff of those colleges, adding even greater depth to its teaching-oriented staff complement.

However, in 2005 UNAM adopted a research strategy (Kiangi 2005) which aimed to increase the production and impact of its research. This, along with changes to the staff performance assessment and promotion review criteria (UNAM 2011b, 2011c), helped to signal the institution's growing research ambitions. In 2011, it also revived UNAM Press, a small but active publishing entity that serves not only the academic faculty, but writers and scholars around the world (who write about Namibian topics).

But the young age of the institution means that the FHSS has a nascent research culture. It is something that is being developed gradually, though scholars acknowledge that it will take some time to grow. While none saw this an insurmountable obstacle to improving research and communication activities, they understood that such improvements would have to be made in tandem with the strengthening and maturing of the institutional research culture.

Scholarly communication policy deficits

At the time of SCAP's inception and initial engagements with UNAM, the policy framework regulating scholarly communication activity was largely undeveloped. It had a useful research strategy, and the university acknowledged the importance of governance structures to drive and coordinate research and dissemination activity, but it had yet to formulate a policy for this activity. (This has since changed, as discussed in Chapter 4 and later in this chapter.)

Another area of concern for SCAP was the absence of an institutional intellectual property (IP) policy. IP is often one of the most challenging components in sharing research content openly. The absence of an IP policy at UNAM was thus problematic for any form of scholarly communication activity, especially when attempting to develop new practices that require engagement with a wide range of outputs. While the development of an institutional IP policy was not within SCAP's remit or authority, we were nevertheless committed to tracking any potential issues and offering support in addressing these issues wherever possible.

Failure of previous institutional repository

In 2006, an international repositories initiative partnered with UNAM to install an IR in the library, known as the Information and Learning Resource Centre (ILRC). Overseen by the library ICT director at the time, it was populated with some digital objects, mostly electronic theses and dissertations, as well as back-issues of the *Namibia Development Journal*.

However, because the repository was installed in isolation – without reference to the broader institutional policy environment – it essentially functioned as a static archive, never fulfilling its potential of being an institutional resource that the academic community recognised as serving the university's social mission. This resulted in limited uptake by UNAM academics as the repository's value was never demonstrated to them.

In 2009, all activity around the repository ceased with the departure of the library ICT director who had managed it. The server remained dormant until early 2011 when the university investigated the prospect of resurrecting it and salvaging its content. External

consultants ascertained that the server had been irreparably damaged by power surges due to the absence of load balancing and disaster recovery mechanisms. All content on the server was lost.

When SCAP discussed potential implementation opportunities at UNAM, the history of this repository failure loomed large for both UNAM participants and us. None of us wanted to revive a repository just for it to fail again. The lessons from that earlier experience had to be understood if they were to be avoided in future repository activity.

Implementation focus

The first change laboratory with the FHSS was hosted in June 2011 to initiate the process of mapping its scholarly communication activity system. In terms of identifying areas which its community sought to address, FHSS participants identified three core areas which they would have liked to have seen addressed in a possible intervention:

- A faculty website which could play the role of showcasing research output
- An electronic publishing platform that could facilitate production and sharing of research outputs
- An IR for the purpose of showcasing a broad array of outputs beyond formal journal articles

Since the university had already committed to exploring the installation of an online profiling (e-portfolio) platform – showcasing the biographies, research and teaching backgrounds of the UNAM academic staff – the development of an IR (to curate, profile and disseminate their research outputs) offered a very useful complementary tool for enhancing the university's research visibility.

Intervention

Given the desires expressed by workshop participants, the proposed intervention focused on reviving the UNAM IR for the purpose of:

- enhancing UNAM's strategic approach to dissemination, in which publishing is regarded as a core function of the university
- making visible scholarly communication outputs which can address national and development issues
- providing UNAM academics with a platform through which they could increase their scholarly footprint and online visibility.

This would be achieved by utilising SCAP programme resources to build a pilot IR in partnership with the ILRC under the guidance of the ICT director. It would also serve to engage UNAM managers and stakeholders to interrogate the philosophical principles underpinning UNAM repository development and how it could be leveraged to address institutional objectives. Lastly, it would also pilot a process in the FHSS of sharing a

broad range of outputs that promote the institutional reputation and address issues of national concern.

However, to assure that we did not reproduce the mistakes that lead to the previous repository failure, our implementation process comprised five phases: identification of institutional stakeholders, planning and strategic document formulation, technical development and hosting strategy, FHSS content collection and policy development.

Phase 1: Identification of institutional stakeholders

In order to establish a sound foundation for renewed repository development, SCAP engaged stakeholders who played a role in institutional scholarly communication. Based on a series of discussions that took place during our site visits, the SCAP PI team stimulated conversation and decision-making processes about who might be best positioned to function as the business and administrative owners for new repository infrastructure. The following stakeholders and were identified:

- The ILRC (library), which provided technical input and functioned as a key partner, being the previous repository host. The ILRC was at this time also transforming from a predominantly undergraduate teaching and learning service to supporting the faculty research endeavour.
- The Computer Centre, the university's ICT service provider. At the time of implementation, it was embarking on a process of bringing the ILRC into campus-wide backup and redundancy processes; the partnership of this entity was therefore crucial in terms of ensuring against infrastructure vulnerability.
- UNAM Press, launched in the first year of SCAP programme activity (2011), brought additional evidence of the university's new strategic vision for growing not only its research agenda, but also for developing channels for engaging with society.
- The *Journal of Studies in the Humanities and Social Sciences*, a new FHSS journal launched in 2012, constituted a locus for new scholarly communication activity, fulfilling a desire that scholars develop new publishing and dissemination platforms.
- The Department of Information and Communication Studies (within FHSS), which provided input on the collection and collation of the content for the pilot initiative.
- The Research and Publications Office (RPO), the institutional body involved in the management and promotion of research.

Phase 2: Planning and strategic document formulation

Given SCAP's ambition for the repository to be considered an institution-wide asset, we engaged with stakeholders from across the university in decision-making processes about the scope and function of the repository. During our meetings, we also aimed to identify parallel initiatives where there might be operational synergies in terms of interaction with the academic community or metadata integration. Examples of these included the e-portfolios initiative as well as a large-scale project to increase the curatorial functionality of the UNAM website.

Current Research Information System (CRIS)

• HR   • Finance   • Student records   • Research and Publications Office   • Postgrad studies

Repository

Scholarship (DSpace)
– Journal articles
– Reports
– Conference papers
– Policy briefs
– Electronic theses and dissertations

Digital library

Digital resources (DSpace)
– Exam papers
– Certificates

Teaching and learning content
Interactive

LMS (Chisimba/Moodle)
– Multimedia
– Podcasts

Static

UNAM portal (PHP)
– Lecture notes
– Coursework access and marks
– Students/class list
– Course outline
– Reading list

UNAM website (Drupal)

FHSS   Faculty   Faculty   Faculty

e-Portfolio
(Wix)
(Mahara)

Figure 6.5 UNAM institutional repository location in the scholarly communication activity system

In order to formalise the various components of repository development, the SCAP RC developed a "Strategic Plan on UNAM Repository Development," which was accompanied by a detailed overview by the SCAP repositories consultant of new required roles and responsibilities (with particular focus on the library). These documents formed the foundation for a stakeholder meeting during the SCAP PI team's third site visit, in which repository linkages to the institutional scholarly communication activity system

(and other projects or activities) were made explicit. Within this framework, the new UNAM website was viewed as the central access entity and institutional "shopfront". These relationships are illustrated in Figure 6.5.

Inclusion of the overarching Current Research Information System (CRIS) in the discussion (and subsequent diagrammatic representation) was illustrative of the ambition for scholarly communication infrastructure and activity to fall within the framework of strategic research management and for technical systems to be integrated with research management systems in the long term.

The result of these discussions was our formulation of a concept document, "Strategic research management and institutional considerations in development and sustainability of a new institutional repository at the University of Namibia", which we submitted to the UNAM administration in October 2012. It identified the following three key challenges, each of which was accompanied by a set of recommendations for how these issues might be addressed:

- Cohesive institutional strategy and academic community interaction
- Library capacity development
- Technical skills shortages and ongoing customisation/development

Other factors for consideration included adherence to national and institutional IP/legal frameworks, addressing the digitisation agenda and linking to data management.

Phase 3: Technical development and hosting strategy

Once foundational scoping and strategic discussions had progressed and stakeholder partners were on board, activity moved to practical application. In the six-month period between September 2012 and February 2013, the SCAP implementation initiative focused on establishing the technical foundations of the new repository and resolving institutional ownership issues.

The ILRC systems administrator, in conjunction with the Computer Centre, undertook technical development of the repository. The systems administrator was supported in this role by a SCAP consultant who was brought on board to provide guidance on DSpace customisation, ensure that development work was in line with international best practice and open standards and assess current redundancy mechanisms. This consultancy identified the fact that there was only one person at UNAM with the requisite systems administration expertise as a potential risk, drawing attention to the need to develop further capacity in this area and expand linkages to other institutions and online communities operating in the same technical framework.

By February 2013, installation of DSpace version 1.8.2 software was complete and running on Ubuntu 12.4 LTS server software, both being the latest versions at the time. The question arose of where to host the platform as the ILRC did not appear to have the technical capacity to provide the required server capacity and technical backup expertise. In addition, there were still concerns about ILRC e-infrastructure linkages to institutional backup and redundancy mechanisms, which were still being developed. It was therefore

agreed that the Computer Centre would function as the *business owner* of the technical infrastructure (taking responsibility for ongoing development, technical support, etc.), while the ILRC functioned as the *administrative owner* (taking responsibility for ongoing content deposit, systems administration, academic community liaison, etc.).

Following the DSpace installation, SCAP funds were utilised to bring a third-party service provider on board to undertake front-end development and provide batch-ingestion functionality. This work was completed by May 2013, but it was acknowledged that ongoing development and further refinement would take place as institutional activity progressed. By July 2013 the UNAM Scholarly Repository[142] contained over 500 resources, comprised of traditional and other outputs as well as a substantial body of theses and dissertations.

Phase 4: FHSS content collection initiative

Concurrent to the technical process of building the DSpace repository, the SCAP UNAM team undertook a large-scale content collection drive in order to populate the repository with content by the time of launch. While FHSS formed the locus of collection activity for the purpose of the SCAP pilot, the ambition was to scale this activity up to the institutional level. In line with this objective, the SCAP RC facilitated a number of institutional engagements with university stakeholders (with particular focus on forums engaging fellow faculty deans) in order to extend the initiative beyond the FHSS. This resulted in positive response and by July 2013 there were content collections for all but one of the university faculties.

The FHSS content collection initiative worked on the principle of utilising a team of student assistants who visited academics in various university departments to explain the initiative and solicit content. This "door-to-door" approach was viewed as crucial for obtaining a response from academics. While it proved to be an efficient strategy for foundational content collection, it was acknowledged that articulation of an institutionally supported mechanism for engaging with the academic community around repository activity and content deposit would be required. The systems administrator, with the support of ILRC and FHSS staff, undertook the content deposit pilot process, though it was acknowledged that additional capacity and a more formalised system would be required for long-term scalability and sustainability.

Phase 5: Policy development

Development of IR policy was viewed as crucial for articulating scope for future development, addressing relevant capacity challenges and ensuring long-term scalability and sustainability. Activity in this area during the SCAP intervention process was driven by the SCAP RC in conjunction with SCAP's UNAM Advisory Board. This Advisory Board membership overlapped, to a large extent, with an institutional task force on scholarly communication convened by the director of UNAM Press in January 2013. One of the key objectives of this task force was to formulate an institutional scholarly communication policy that would address, amongst other things, the institutional

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142 UNAM Scholarly Repository, available at: http://repository.unam.na/

position on open access and the ambition to grow publishing activity within the university.

A draft Scholarly Communication Policy was presented to the UNAM Senate in May 2013 and ratified in August 2013 (UNAM 2013). This was accompanied by a Research Policy and a Research Ethics Policy and Guidelines for the University, also submitted to the University Senate for approval in May 2013. These recent policy formulations aimed to build on the UNAM Press Policy of 2011, which identified the need for an overall scholarly communications policy "to cover the range of publications emanating from the University … different types of publication, different forms of dissemination, e.g. print and online, sales or free distribution."[143] The Press Policy had additionally made it explicit that further policy development in this area "needs to address the University's position regarding online publication, the sharing of data, and open access to some University research."[144]

The policy aims were identified (UNAM 2013: 5–6) as to:

- provide guidelines for communicating scholarly outputs
- raise the profile of UNAM's research and enhance its impact and contribution to national development
- establish common standards of academic writing and scholarly outputs
- ensure quality by promoting adherence to best practices
- make UNAM's outputs accessible in different formats to different audiences
- establish sustainable management strategies for communicating outputs
- strengthen the preservation and archiving of UNAM's outputs.

This policy is noteworthy in that it takes a broad approach to open access and content sharing, accounting for content genres and processes outside of formal book and journal publications, acknowledging the importance of evolving quality assurance processes. The commitment to open access is explicit and functions on the assumption that, "as a largely public-funded institution, [UNAM] has an obligation to share its research findings and scholarly outputs with all stakeholders and the wider society" (UNAM 2013: 8). The policy identifies repository development as a key mechanism for supporting OA activity and makes explicit the roles and responsibilities governing scholarly communication.

The ability of UNAM to develop a repository, articulate a policy to govern it and drive the open access agenda within a short period of two years served as an indication of the university's commitment to addressing scholarly communication activity and enhancing its research impact.[145]

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143 UNAM Press Policy adopted by Senate 31 October 2011, Resolution SEN/11/2211/100
144 Ibid.
145 The new Scholarly Communications Policy explicitly acknowledges the contribution of the SCAP programme in its Introduction: "The Scholarly Communications in Africa Project of the Faculty of Humanities and Social Sciences (2011–2013) has proved to be a valuable pilot project in this regard and has identified many of the issues to be considered in the development of a scholarly communications policy for the University" (UNAM 2013: 4).

Lessons learned

The success of this implementation initiative was due, in part, to its alignment with both institutional and national strategic focus areas. University management supported the SCAP programme throughout the three-year period of engagement, with administrators, academics and other partners demonstrating interest in the programme's potential to advance the scholarly communication agenda and contribute to institutional development. Alignment with the goals of high-level stakeholders facilitated a relatively smooth institutional relationship and the UNAM RC's dean status was also instrumental in bringing executive weight to the implementation initiative. These factors combined to help this initiative to move beyond the pilot stage at a faculty level to full-fledged engagement at the institutional level. Through this process, SCAP was able to learn a number of important lessons regarding scholarly communication at UNAM, including:

Lesson 1: Decisions about IR ownership and governance structures need to be made in consideration of the current functioning institutional scholarly activity system and available capacity of various stakeholders. Simplistic assumptions about the repository host entity and the various roles of institutional stakeholders involved in scholarly communication and archiving (such as the library, information technology entities and university press) can overlook the historical and cultural legacy of these stakeholders and make incorrect assumptions about their capacity to engage with new forms of scholarly communication. Since open access and e-research are still relatively new phenomena for many Southern African institutions, Northern-based models for location of activity may not be appropriate in these contexts.

Lesson 2: Development of e-infrastructure needs to be accompanied by development of human capacity. In the rapidly evolving world of IT- and internet-driven communication, it is important to guard against the temptation to focus investment on technology and new e-infrastructure while neglecting human capacity development. It is important that university personnel placed in new scholarly communication roles not only receive the training required to provide new services to the academic community, but also to have a sense of the purpose and scope of the work they are doing.

Lesson 3: Engagement of the academic community continues to be one of the greatest challenges in sustained repository development. While many FHSS academics expressed an interest in the SCAP initiative, it took considerable time and effort to get them to share their research in the repository. The lack of time, rewards or incentives for sharing their outputs hinders scholars' interest in making the effort to submit their materials to the repository. This mirrors an international phenomenon in non-mandated open access repository work, where deposit rates have often been low (Ferreira *et al.* 2008; Finch 2012; Geiseke 2011; Harnad 2009).

Lesson 4: Repositories are unlikely to function optimally if they are not integrated into institutional strategic planning structures and core IT frameworks. The failure of the previous UNAM repository can be traced, in part, to the fact that it did not extend beyond the library to the broader academic community and cement the protocols for ongoing functionality and sustained growth in institutional policy.

Conclusion

These four implementation initiatives give an indication of not only the diversity of scholarly communication ecosystems at Southern African universities, but how they are shaped by history, culture, traditions, capacity, disciplinary norms and visions for the future. Rather than being assumed to share a general set of challenges to be addressed with a single technology or policy solution, each ecosystem had to be researched and understood before an implementation initiative could seek to improve scholarly communication in those contexts. To increase the likelihood of success in each case, we not only carried out extensive research with pilot site participants and university managers and librarians, but also elicited participants' desires regarding how they wanted their activity systems to change and tried to implement pilots that spoke to their desires. This was not always easy – especially since many scholars were not aware of the various tools, technologies and strategies available to enhance their scholarly communication and visibility – thus we tried to improve their own analyses and insights by sharing with them trends and developments from around the world in this regard. Our relationship was thus a partnership in which we collaborated to improve their scholarly communication ecosystem, with feedback from inside and outside that system.

Thus, at UB our implementation activity focused on enhancing the value and utility of an existing technology, the IR, which had grown stagnant through inappropriate workflow processes. Part of the problem had been that one of the envisaged processes – that of having departments identify, vet and submit materials to the IR – had never been implemented. Thus, we piloted a QA process through DLIS which showed how a content identification, vetting and submission process would work at a departmental level. The process surfaced a number of unanticipated challenges, but ultimately showed that this workflow plan was feasible. This was important as it showed that, moving forwards, not only would such a workflow process have to be incorporated into the usual working activities of the departments, but that the library would have to establish a workflow process that could take that submitted material and quickly upload it to the IR. When that occurs, UBRISA will start to live up to its potential as an IR and make more of UB's research visible.

At UCT, we worked with SALDRU to revamp its unit-level profiling technology, changing it from a Joomla-run system to a DSpace repository system which we believed was more appropriate for handling the kinds of digital content that SALDRU had amassed over the years. With the help of a content architect who set up the installation and then transferred all of SALDRU's materials to the new system and protocols, the pilot showed how small research units operating in UCT's decentralised policy space could nonetheless develop their own research profiling mechanisms that would allow them to raise the visibility of their scholarship. Similar to the UB initiative, the success of the pilot was not based on buying a brand new technology (a temptation if one operates with a techno-deterministic mindset), but on improving the technologies that were already present, making them more cohesive and strategic.

At UoM, we forewent the idea of utilising any bespoke technology and had FoS scholars engage with free Web 2.0 tools that can curate and profile their work, as well as serve as a platform for raising their own personal visibility while enhancing their chances of

connecting and collaborating with others internationally. This was chosen as a strategy because UoM lacked the capacity to install and maintain a new technology (such as an IR) and because scholars are relatively free to set the pace of their own research endeavours. They enjoy a good deal of autonomy in their research and dissemination activities, thus we implemented a pilot that leveraged that individual freedom. In this case, the potential of the strategy was limited by the fact that scholars were not dissatisfied with the level of visibility they achieved through traditional communication models, through their own disciplinary outlets (many of which are OA by default) and through international conference opportunities where they meet with colleagues and establish collaborative relationships. While their preferred strategies did not lead to high levels of visibility or connectivity (at least compared to what these levels could be), their activities were in line with the government's strategies for knowledge transfer, achieved primarily in direct relationships between identifiable communicators (scholars) and receptors (industry, etc.), not dispersed openly to anyone who wants to access it. Thus our implementation initiative was successful in raising awareness about the possibilities of utilising Web 2.0 tools to overcome UoM scholars' geographical isolation through virtual means, but it is too soon to tell whether it has changed their scholarly communication ecosystem in a meaningful way.

Lastly, at UNAM we helped to re-establish a technology that had existed in previous years – an IR – but which had failed and become dormant. In reviving the IR, one of the key aspects of the implementation process was identifying the workflow and ownership issues involved in running it, as deficiencies in these areas led to the loss of the previous IR. Similar to the UB pilot, we developed a QA, vetting and content profiling process for the FHSS to adopt, using its faculty members' outputs as the pilot materials for what would then grow into a fully fledged IR. By starting with just the FHSS, we were able to assess workflow procedures in a manageable setting, though since the pilot has occurred, other faculties have also adopted the process and have started submitting their materials to the IR. This pilot was a success not only because the institution wanted to learn from its past mistakes regarding the running of the previous IR, but because it took the time to lay the policy foundation upon which this IR would rest while at the same time identifying the roles and responsibilities of the various parties involved with running it. Instead of being the pet project of a single motivated staff member, the new IR is now truly an integrated part of the institution.

Chapter 7
Challenges, contradictions
and opportunities

A key element of SCAP's research was to identify the main challenges, contradictions and opportunities in the scholarly communication ecosystems of our four research sites, especially as they pertain to the dissemination of digital research outputs (articles, conference papers, reports, etc.). By working with the different units, departments and faculties at the Universities of Botswana, Cape Town, Mauritius and Namibia, we were able to assess elements of these ecosystems as they pertain to unit, departmental, faculty and institutional concerns. In this chapter we analyse this multi-level ecosystem that not only reflects Southern African scholars' reality, but offers critical and constructive insights for moving the discussion about the promotion of optimal scholarly communication at the region's universities forwards.

By "optimal" scholarly communication, we mean the dissemination of digital outputs which are open access (free to the user); visible (quickly findable on the internet); profiled and curated (typically on an institutional repository); understandable to audiences that would most benefit from the knowledge contained within them; aligned with the mission and values of the university and the country; ambitious and original; adequately funded (by the university or another funding body); recognised by the author's colleagues and university as valuable; and of a high quality. This is an admittedly particular understanding of what constitutes optimal scholarly communication – and will hopefully add to the debate on such – but for the sake of the following discussion, this is what we mean by it.

Challenges

The challenges impacting our four Southern African scholarly communication ecosystems most are: institutional culture; research culture; funding; time; e-infrastructure; skills and capacity; and continental marginalisation.

In this discussion, a "challenge" is defined as a crucial factor in the scholarly communication ecosystem that inhibits the optimal production and dissemination of research. A challenge can be a durable feature of that system (such as funding constraints) or an ephemeral one produced during a transitional phase (such as a nascent research

culture), but each stands as an obstacle to optimal scholarly communication and is not easily remedied through the actions of any one agent (management, scholars, government personnel). Challenges are often the inadvertent by-product of a broader social, political, educational or financial concern, such as the recent global economic recession or the rapidly changing requirements of the ICT landscape. Typically, there is little that an institution itself can do in the short term to overcome these challenges, but through long-term strategic planning and implementation, it can certainly ameliorate them and, in some cases, turn them into opportunities.

Institutional culture

Each university that we engaged had its own character, history, values and traditions – their own "institutional culture". This term may slightly reify what in fact were dynamic contexts, but it helps to stabilise our perception of an environment for the purposes of analysing it. Bergquist and Pawlak (2008) identify six institutional culture types for academia, of which the collegial, developmental and managerial were the most relevant in our circumstances. For instance, ws we discuss later, UCT is best understood as having a collegial culture, where power is located in the faculties, and which values rationality, shared governance and decision-making and academic engagement. Meanwhile, UNAM has a developmental culture in which the institution prioritises the personal and professional growth of both students and faculty members. These are suitable cultures for these institutions, given their histories and desires for the future.

However, this is not the case at UB and UoM, both of which have centralised administrative structures that create certain challenges regarding the development of scholarly research and communication activity.

UB managerialism

Unlike the other universities we profiled, the institutional culture at UB is best described as "managerial" (Berquist & Pawlak 2008). This is true not only in the sense that the administration holds significant sway over the direction of university strategy and policies, but in the legitimacy that academics accord it as a strong, centralised authority structure.[146] But that legitimacy has been questioned in recent years by scholars who feel that the management has gone too far in catering for its own interests rather than those of the academic staff. They feel that the "top-heavy", "bloated" administrative structure has lost sight of the true mission of the university (UB Academic Staff 2012: 3).

Scholars feel that the expanding management structure costs too much to support financially, and that the job descriptions for these high-level managers "are logistical (clerical) in nature and not strategic and can therefore be performed by lower ranking employees" (UB Academic Staff 2012: 17). All of this has combined to create a negative working

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146 These power relations resemble that of paternalism, where a management stratum asks for, and is given, a great deal of authority (to create policy, dictate norms, etc.), with the understanding that it must fulfil certain critical moral obligations towards the governed strata (pay decent wages, be flexible with the application of rules when issues of personal dignity and public reputation are at stake, etc.). This authority structure is well known in the history of Botswana, and in fact is seen by many analysts as describing the national government's relationship with its citizens (Holm 1987).

environment which "has seen a number of disturbing academic staff turnover in recent years and it has been struggling to recruit and retain staff" (UB Academic Staff 2012: 1).

While most academics at UB are fine with a strong and centralised administrative authority, they believe that it should operate within certain guidelines – a "moral economy" – that also remain cognizant of scholars' interests. At the moment, they believe that the management has breached the terms of the unspoken contract between it and the academics, a fact which jeopardises a number of critical academic functions, including the research imperative.

The primary challenge for enhancing research through a managerial system is assuring that research production is sustainable. Since it was only in 2008 that the university Senate ratified comprehensive policies which would turn UB into a "research university", it is too early to tell whether these extrinsic mechanisms – such as the performance management system (PMS) – will lead to sustainable productivity. Evidence suggests that the top-down mandate has successfully raised the level of research production in the short term, but some suggest that it is already breeding resistance and demoralisation amongst the staff (Marobela & Andrae-Marobela 2013). Thus a number of questions remain:

- Will these extrinsic mechanisms be enough to sustain a high level of productivity?
- Will they lead to quantity at the expense of quality?
- Will they be as efficient as a system in which intrinsic motivation – personal joy, desire to contribute to the field – drives research outputs?
- Will they foreclose the development of a more peer-regulated research culture in which productivity is inspired by organic collegial expectations rather than expensive accountability and enforcement mechanisms?

These remain open questions, but based on the qualities that now characterise the academic–management relationship – where the academics are organising and demanding that their interests be recognised – it would appear that such management-driven research mandates will be effective within certain limits because they fail to tap into the social and personal factors that are also important for motivating sustainable research activity.

UoM bureaucratism

In contrast to UB's strong, centralised authority structure ("managerialism"), the UoM institutional culture is also highly centralised, but weak (Manraj 2013). That is, on one hand, the administration employs a variety of bureaucratic processes which ensure that even the smallest decisions made by academics are referred back to it for official approval ("red tape"), thereby centralising authority at the institution ("bureaucratism"). But on the other hand, the administration has largely vacated the strategic role that it is supposed to play in shaping the policies that drive research and dissemination activity, leaving scholars on their own to decide how much research they would like to produce and how they would like to communicate it.

Part of this can be explained by the institutional instability that has beset UoM over the past few years caused by the unforeseen resignation of a popular vice chancellor in early

2012, followed by the dismissal of his replacement less than a year later for unknown reasons.[147] This has had an unsettling effect on the administration, which has essentially frozen the implementation of a number of research strategies that were developed under the former VC. But this type of paralysis can happen in a centralised yet weak administrative structure that is rendered leaderless. Since authority radiates from the top in such organisations, they do not perform well without a credible figure placed there (in this case, too many figures have been put there: UoM had five VCs in the four years between 2009 and 2013). The middle and lower management strata, which could otherwise have stepped in to make sure that the university's research strategies are still being implemented, were not been empowered to take such initiative. The result has been that the chaos of the VC's office has been replicated in the maintenance of the research strategy.

Another reason why the university has a centralised but weak institutional culture is its historical development. One scholar shared that "they put in all the administrative structure first and then said, 'well, then we need professors.' So from the beginning itself, it was very centralised." This has lead to what some complain is a skewed ratio between academic and administrative staff: "At the university there are about 1,000 people employed. Only 250 are academics. The rest is mainly bureaucracy."

There are benefits, however, to this centralised but weak administrative arrangement. Even though academics often need to seek managerial permission to make even mundane decisions, they are nonetheless relatively autonomous in how they carry out their work, construct their careers and approach research and dissemination. Many scholars appreciate the latitude that this affords.

But when it comes to the changing imperatives surrounding scholarly communication in the digital, open era, the administration's lack of a strategic vision makes it difficult for the university to operate according to an integrated research and communication plan that leverages open communication practices. Moreover, with the government and the university's desire to turn Mauritius into an "innovation hub" for the region, it may be difficult for the university to act as a powerful engine of innovation when its own internal structure is designed to limit personal innovation and risk-taking.

Research culture

Most African universities have only recently embraced a research mission, thus they are in the process of trying to build up strong research cultures that could sustain a solid level of research outputs. A research culture is shaped by multiple elements – policies, levels of motivation, financial resources, disciplinary norms, scholarly traditions and collegial expectations – which determine how weak, strong, efficient or effective it is. While a research culture is always in transition to a certain extent, we can get an idea of the current state of our four Southern African universities' research cultures and how they impact scholarly communication activities. Essentially, due to a number of factors

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147 Guillaume Gouges (17 August 2013), Controversy as university fires vice-chancellor, *University World News*, available at: www.universityworldnews.com/article.php?story=20130816180045660

discussed below, the research cultures at UB, UoM and UNAM can be characterised as "nascent", while UCT's stronger research culture is impacted by its decentralised, "siloed" structure.

Nascent research cultures at UB, UoM and UNAM

UB managers and scholars are keen to develop a robust research culture, one that is intellectually vibrant, productive and nurturing for younger people. At the moment, this is still to be achieved. A number of challenges emerge in this regard. First, sharing between scholars is not as optimal as it could be, due to both fears of intellectual theft and the heavy teaching loads that occupy most of the academics' time.

Second, according to one scholar, the academic staff are essentially treated like glorified civil servants in that they are expected to spend their work hours in their offices rather than, say, out in the field conducting research (even during the summer break). As is often the case in managerial contexts, the office serves not only as a workspace for scholars but a site of passive administrative surveillance: for as long as scholars are in their offices, they can be assumed to be "doing their jobs".

Third, in such a cautious and rule-sensitive environment, scholars say that it is difficult to get funding for researching "risky topics". Only "safe" research proposals get support, so academics find it difficult to "push the envelope," as one scholar complained.

Fourth, this comparatively conservative approach to research appears to shape classroom teaching practices as well, as many scholars use materials sourced from literature reviews to teach rather than their own research.

Of course, it is important to put all of this in context: UB only recently committed itself to becoming a research university, something it hopes to achieve by 2021, so this description of the institution's research culture is not the last word on what it is or will be. However, these challenges will remain unless scholars and the administration address the values underpinning their reproduction.

UoM's research culture is also relatively nascent, individuated and uneven across departments and faculties, for three reasons. First, the demographic realities of this small institution – in which scholars are essentially the lone experts in their particular fields – impact the ability of FoS scholars to collaborate with each other. Most of the scholars who engage with the topics in which UoM academics have a research interest work at overseas universities. This diminishes the quantity and quality of scholarly communication between faculty members at UoM, reducing the development of a robust and dynamic on-campus research culture.

Second, because the administration provides weak guidance concerning research and communication matters, scholars are largely free to choose whether they want to embark on intensive research careers or more teaching-oriented ones. Thus, research production relies heavily on the personal volition of the scholars themselves, a highly fluctuating and inconsistent variable in the development of a stable research culture.

Third, not only is there very little administrative pressure to produce research, there is also very little peer pressure from their own colleagues to do so. With research activity so individualised, FoS scholars lack the inclination to share their research with each other and thereby miss opportunities to support and push their peers.

At UNAM, the institution's research culture can be described as nascent for historical, demographic and structural reasons. First, as a young university (just over 20 years old), the systems and traditions required to create and sustain a dynamic, strong research culture are still in the process of being established. Second, UNAM has been and remains a teaching-oriented university. Producing graduates is still the most powerful contribution that the university can make to the nation, a fact that strengthens the importance of the teaching mission. Third, UNAM recently merged with a number of teacher training colleges, absorbing staff whose academic identities are based on teaching, not researching. While many of these scholars are open to adding research to their job responsibilities, others are less enthusiastic. And all of them require time to develop their research skills.

Fourth, there is little peer pressure (collegial expectation) to produce research at UNAM. The promotion system creates an incentive for some academics, and many senior scholars encourage junior scholars to produce research, but the teaching and administrative obligations are such that most FHSS members feel the greatest pressure to meet those requirements before attending to research. Fifth, FHSS scholars feel that there are not enough opportunities to share their research with colleagues, such as through seminars and colloquia.

However, this is not to say that efforts are not being made to build up a robust research culture. For instance, according to one scholar, "The Faculty of Humanities and Social Sciences is leading in this respect as far as our new journal is concerned. In our case, we're disseminating our research via the journal. That's why we created it. But most other faculties don't have a similar platform." Thus, as one manager summed up the situation, "There is some elemental collaboration and scholarly communication in terms of public lectures and we have our annual lecture series, we've got our journal, but I'd say it's still at a formative stage."

UCT's research silos

UCT's "collegial" institutional culture (Bergquist & Pawlak 2008) is both its greatest strength and its greatest weakness when it comes to scholarly communication. On one hand, it provides a sustainable and enriching environment for a highly productive research academic staff. Scholars hold substantial power at UCT, enjoying a degree of autonomy from the central administration. This is empowering for the academics, allowing them a good deal of latitude when it comes to picking projects and doing research. On the other hand, such collegiality makes it difficult for the institution to adapt quickly to new imperatives – such as embracing open scholarly communication strategies – because power is too decentralised for broad imposition or enforcement. Change rarely happens at the university based on administrative fiat, but occurs after a long process of engagement and debate across all of the faculties, which individually decide how to proceed in line with their own traditions, missions and values.

As a university with multiple campus locations across the city, the difficulties involved in pushing for institution-wide change are significant, because most of the faculties operate in geographically and intellectually isolated "silos". As one manager explained:

> *UCT is the biggest prairie with the largest number of silos I've ever seen. I mean, this is more siloed than any university I've worked in. And it has something to do with its age and the particular structure of faculties. They're very autonomous, they're spatially dispersed and they're very competitive. So funding comes down through the silo, which means that promoting inter-disciplinary work is very difficult. So you tend to have scholarly communication within silos, in quite a rich way. I mean, there are a lot of venues virtual and literal – or geographical or spatial – for seminars and things to happen, [hence] this is a very communi-cation-rich environment, but the arrows are sometimes quite uni-directional and it's difficult to change the vector.*

In the rapidly changing world of scholarly communication, this can be a problem, creating a situation in which some departments or faculties have embraced a modern, open scholarly communication paradigm while others have yet to start a conversation about it. UCT's central administration, which is currently engaged in thinking about this issue, does not have the authority – nor the inclination – simply to require that all faculties abide by any new strategies that it embraces. Any institution-wide changes in this siloed environment take a long time, involve significant political sensitivity and ultimately include the buy-in of the individual faculty members.

Sharing many of the qualities defining a democracy – participative, deliberative, egalitarian, messy – UCT's collegial culture requires lengthy periods of time for it to change. Usually this is good, in that when change occurs, it has been thoroughly debated and legitimised. But sometimes when there is urgency in the change required, the process can be frustratingly slow.

Funding

At most universities in Africa that are trying to ramp up research production, funding remains a perpetual challenge. Amongst our four Southern African universities, funding was not as challenging an issue as it appears to be elsewhere, but UB and UoM – two universities with strong research ambitions – find it difficult to reach their objectives given the current resources devoted to research.

At UB, funding is a challenge for conducting and disseminating research, not only for the direct financing of various projects, but for providing the ancillary materials necessary for carrying them out. It is important to stress that the government does provide money to the university for research, and that this has grown with the commitment by the institution to become a research university. However, the question here is whether the funding is enough to achieve the goal of creating a dynamic research culture which consistently produces high-quality scholarly outputs. At the moment, scholars and managers agree that more funding would be required to reach that ideal, hence the relatively low levels of funding create a series of challenges that impede the research imperative.

First, with limited money to disburse,[148] the Office of Research and Development (ORD) is keen to fund as many projects as possible to spread research opportunities amongst the staff and to make sure everyone gets a fair chance at pursuing research. But that often reduces the amount available for any single project, inducing many scholars to conceptualise research projects that are small-scale, localised and inexpensive. (One manager lamented, "There is no funding that can help academics carry out their work. The most we can get, if your proposal gets chosen, is P25,000 [USD2,525][which is not enough].") Proposing small-scale projects increases scholars' chances of getting funding, but it also limits their ambitions, encouraging them to see research as something done in discrete little pockets, not as part of a long-term career-developing contribution to scholarship.

One scholar summed up the results of this approach, stating, "We have a situation where we really don't have a path that leads to publications, a path that makes somebody an expert in a particular field … People just do the smallest of things so that they can be counted amongst those that have done research or are doing research."

Second, the small amount of research funding also means that many people have to conduct it without any financial support. In the humanities, certainly some research can be carried out without extra money (such as a literary analysis of a novel), but most others involve some level of transportation (to field sites), equipment (digital recorders) and support services (transcription) the costs of which, if unfunded, have to come out of the scholars' pocket. This is indeed the case for many scholars who set aside their own money for their small projects. They admit that this is not ideal, leading to very narrow research foci.

Third, lack of funding also limits the level of interaction that scholars can have with their peers elsewhere, particularly at conferences. UB academics are keen to go to regional and international conferences to present their work, get critical feedback, network with their peers and consider collaborative opportunities with people outside UB. But as the travel fund is limited, most scholars are only able to go to local conferences, or perhaps one in a neighbouring country occasionally. Ironically, as one academic relayed, "Scholars are told to research and present their findings, but we're given too little money to actually go to conferences."

Lastly, the lack of funding essentially confines all UB research activity to Botswana. As one scholar pointed out, this has the effect of making UB research inward-looking and provincial because scholars lack the means to cast their analytical gaze beyond their borders. For many scholars, this is fine because they desire mainly to contribute to the development and understanding of Botswana itself. But it also inadvertently reinforces a global power dynamic in which scholars in Botswana can only study themselves, whereas "Westerners" are able to study not just themselves but Batswana and other Africans too. What would be preferable, this scholar suggests, is if UB scholars were free to do both, and had the financial capacity to do so.

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148 In 2009, academics applied for P 7.5 million in research funding, but only P 2.6 million was available to disperse.

Echoing UB's funding challenges, UoM FoS scholars also complain that there is a relative lack of funding which impacts the types of research they can pursue and the types of resources they can access. For instance, according to one scholar, "The MRC has got only 10 million rupees [USD322,581] per year to fund research," an amount that has to be doled out to multiple competing project proposals. The university itself also has a limited research budget, which shapes how ambitious a scholar can be in conceptualising a project.

This is compounded by the limited funds for activities such as conference travel. According to one scholar, the conference travel fund is usually exhausted within six months, thus it is impossible to go to conferences that come up after that, until the next funding tranche comes in. This reduces the networking opportunities that FoS scholars desire with overseas colleagues. As one scholar noted, "If we had the funding to travel, I don't think that geographical barriers would be an issue."

Lastly, it is challenging to access certain intellectual resources due to the small library budget. As one librarian shared, "A major obstacle is the funding. Our budget doesn't allow us to buy as many books as we would like to or even subscribe to journals. Sometimes we get a request for a journal, but we don't have the funds." Scholars try to overcome this challenge themselves by leveraging their personal connections, but "if you do not have a contact [at a well-resourced overseas university], it's impossible to get the right research papers."

Time

One of the greatest deterrents to the production of research at most African universities is the lack of time that faculty have for conducting research. Burdened by heavy teaching and administrative loads, they claim that they do not have enough time to meet the growing demands for research outputs put on them by the administration. This is not a new finding, as most other literature on African higher education makes the same point (DHET 2012a; Lindow 2011; Mamdani 2007, 2008; Mlambo 2007; Mouton *et al.* 2008; Sall 2003; Sawyerr 2004; Zeleza 2002), but SCAP's research does suggest that, if Southern African universities are going to reach their goals of becoming "research universities" in the future, they will have to attend to the fact that their scholars are still overwhelmingly preoccupied with non-research activities (as we saw in Chapter 5). The teaching-oriented legacy of these universities remains powerful, as do the current teaching demands that structure academic labour.

At UB, this challenge is acknowledged by everyone, not just the scholars. As one manager explained:

> *Another reason why research is thin … is the staff allocation workload. Here we've got very big classes. You know, the teacher/student ratio is terrible. Officially, it is one to sixteen. But in reality, it will be one to 200, because I know of people who teach 400 students in one semester … So teaching is very heavy and that compromises the space left for research. That is one reason why*

people end up doing easier parts of research and not the kind of research that they would normally wish to do.

This is compounded by the burden of administrative tasks that take scholars away from their core academic functions. As another manager reported:

We find that academics often have to do clerical duties like registering students. You sit the whole week in an office or some conference room registering students manually. And this means that you don't even move an inch until the registration is done. That's not all. The production of transcripts and grades and the invigilation of exams are all done by the academics. So they spend maybe a third of their time doing clerical duties like those.

Though this temporal challenge is mentioned frequently in discussions of African scholarly communication – and was a constant refrain at UB, UoM and UNAM – its commonplaceness as an explanation for reduced research capacity cannot be trivialised.[149] It also stands as one of the more difficult challenges to overcome unless the university can hire more academics or re-assign certain administrative tasks to graduate students or clerical staff, either of which would require significant money and capacity.

e-Infrastructure

Despite the various financial constraints that our Southern African universities face, they are nonetheless relatively well-resourced compared to many other African universities. However, when compared to an "ideal" research and communication environment, scholars were able to point to various e-infrastructure challenges that they hope will be improved.

At UB, for instance, when asked what technological challenges the university faced in its research endeavours, the only one that was brought up with any consistency was the slow internet speed (low bandwidth) of the university broadband system. This is, of course, a relative concept, but the SCAP team saw first-hand how lengthy download times led to websites timing out (not rendering pages because it took too long) and how it slowed down research work that would be achieved much more quickly with a higher-speed connection. This slowness was also recognised by the administration, which has embargoed certain high-traffic sites, such as Facebook, between 8am and 5pm. This serves another purpose as well, to keep students focused on academic rather than social activities, but it is primarily meant to preserve the limited bandwidth for educational work.

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149 The CHET/HERANA reports on universities and economic development in Africa assess teaching loads at eight African universities according to official student:staff ratios. At UB, the authors indicate that in 2001, the student-staff ratio was 1:14, but by 2007, it was 1:27, almost doubling in just six years (Cloete, Bailey & Maassen 2011: 27). They conclude that this was "manageable" (2011: xix) for teaching purposes, and that the numbers do "not support the stereotype of 'mass overcrowding' in African higher education, certainly not at flagship universities" (2011: xix). While it may be true that the teaching loads are "manageable", our ethnographic and interview data suggest that UB teaching loads (at least for Humanities staff) are substantial enough to hinder research production significantly. We find the student:staff ratio too blunt an indicator to reveal how teaching and teaching-related duties impact scholars' temporal regimes.

Low bandwidth is a problem elsewhere in Africa, but it is often accompanied by a general lack of technological facilities. This is not the case at UB, which is relatively well provisioned, boasting an institutional repository (IR), staff and student computers, a state-of-the-art archival scanner, high-powered research management software, etc. Thus, for the most part, the university has the technology it needs, but the challenge it faces is in developing an e-infrastructure strategy that utilises not only this technology, but leverages the university's human capital to maximise the production and dissemination of research.

At UoM, FoS scholars have access to a certain level of e-infrastructure – such as a the basic requirements for computers and broadband internet – but when it comes to the technologies necessary for enhancing scholarly communication, that access is either lacking or achieved without any corresponding strategy.

For instance, UoM does not have an IR, one of the standard technologies that universities can utilise to curate, profile and disseminate their scholars' research. The establishment of such a dissemination platform, however, requires significant human capacity as well as a clearly articulated strategy, a locus for that technology and a workflow process. In this case, the lack of a communications strategy explains the absence of the IR and means that, if the university hopes to enhance scholarly communication without it, UoM must seek alternative options that either leverage national or regional capabilities or incentivise individual scholars to make their own work more visible.

The university also does not employ the open source Open Journal Systems (OJS) platform for publishing its *University of Mauritius Research Journal*. This means that, even though the journal allows some of its articles to be downloaded for free in an open access fashion, it lacks many of the features that would make the journal more attractive, visible and easy to use.

Some scholars and librarians also suggest that "the lack of adequate affordable bandwidth" hinders scholars' research efforts, though this appears to have been improved recently.

In some ways it is premature to identify e-infrastructure gaps in the absence of a communication strategy against which to assess them, but it is clear that these gaps will remain a challenge until they are addressed.

Skills and capacity

As Southern African universities start to engage with new scholarly communication technologies, it becomes clearer what skills and capacity are necessary for embracing the technologies. Sometimes this capacity is taken for granted, especially by funders who provide various technologies to institutions on the assumption that a given category of employee (such as librarians) can operate and maintain them. That is not always the case, as our research showed.

For instance, UB personnel recognise that they have some skills gaps that, if bridged, would improve their research and communication. When asked if they would benefit from training in certain research and dissemination activities, 61% of FoH survey respondents said that they would for "publishing in journals," 61% for "publishing books or monographs," 95% for "using open access platforms" and 78% for "engaging in Web 2.0 activities." While most have some familiarity with these processes, they believe that some directed instruction to streamline their efforts would be useful.

This is also true for librarians who understand that, as scholarly communication evolves, their skills set to meet the new demands must also evolve. This requires occasional, yet consistent, training for keeping up with trends and offering the best service to academics. As one librarian intimated, this also means helping to train professors in how to use the resources that the library has. As the library becomes more of a digital research hub, scholars need to know how to use its powerful search tools.

This is also true for UNAM FHSS staff members, who say that they would benefit from training in certain research and dissemination processes: 85% said that they would for "publishing in journals," 87% for "publishing books or monographs," 91% for "using open access platforms" and 80% for "engaging in Web 2.0 activities." While many have some familiarity with these practices, most believe that some directed instruction to streamline their efforts would be useful.

UNAM librarians agree, hoping that their work can become more "professionalised" through greater training and responsibility. As one said, "the majority of librarians in the country and beyond have not been trained in aspects of management" but "I would like us to become more than just traditional librarians. I would like librarians to become information managers."

During SCAP's visits to both UB and UNAM over the course of two years, it hired a consultant to carry out a number of training sessions with librarians at both institutions regarding the use of DSpace (a metadata language for profiling and curating digital objects on IRs). Her experiences with these librarians revealed the extent to which both universities are reliant on the library staff to help to promote new forms of scholarly communication, and also how unprepared many are for that role, as they were originally educated to be "traditional" librarians, dealing with paper materials and rigid classification procedures. The move to digital has upended all of the certainties of their field, requiring a new strategy and set of skills for leveraging human capacity at the university.

African marginalisation

Finally, all Southern African scholars must contend with Africa's marginality politically (Mkandawire 2011); geographically, in that it is located comparatively far away from the major population centres of Eurasia and North America (Olukoshi 2009: 17); and intellectually, in that it is a small player in the competitive world of academic knowledge production (Abrahams, Burke & Mouton 2010; ASSAF 2006; Gray 2006; Limb 2007;

Tijssen 2007). While this condition shapes many aspects of African higher education, Africa's political, economic and geographic marginality are not issues that most Southern African scholars get overly concerned about, simply because none of these situations are easily changed. However, the relative invisibility of African scholarship globally does discourage and upset them, especially since they believe that this is unnecessary.

At UB, for instance, one professor explained, "We really want to draw attention that there's a lot of good material, a lot of research that has been generated within Africa with some really good results, comparable to whatever is being done elsewhere. But nobody seems to know about it." This sentiment animates the response that many UB scholars have had to the potential of open access scholarly communication, seeing various Web 2.0 tools as opportunities for raising the visibility of their work.

This coincides with another concern about the marginalised status of African language research (both *on* and *in* African languages) which, for the most part, remains unrecognised on the continent and beyond. As one scholar lamented:

> *We have colleagues who are experts in African languages, and they write their publications and most of their research is on African languages and they publish African books in African languages. But when they get out there, they're not considered as experts, because all they've been writing is about either Zulu, Tswana, Ndebele … and they are experts in their own right. Their works are really worth thousands and thousands of pulas, or dollars, but because they are writing using their local languages, or their main interest is in writing using the local language, they are not considered as experts out there. So I don't know how we can really address some of those concerns.*

This is a situation that African scholars have some ability to respond to and change, if at least on the continent, though the impetus to challenge the dominance of European languages in African higher education appears to have subsided since the early years of the independence era.

For UCT Comm scholars, the real problem is that they lack face-to-face contact with the masses of scholars in their fields who are located primarily in the North. They do their best to attend international conferences and invite overseas scholars to the university to share their research, but they can never achieve the density of engagements – and the broadness of exposure – that typify intellectual exchange at well-resourced Northern institutions. Thus, according to one SALDRU member:

> *Another big challenge is just access to a lot of quality research. So if you go sit for a year through the development seminar at Michigan or Princeton or Chicago, in terms of what you're going to be exposed to, [it] stimulates and generates new ideas. [But] you're in a sleepy hollow here [at UCT], so … this is just a very small pond. We all know each other, whereas in the bigger US market – and within their actual institutions – it's close for people to come and visit and so they get exposed to a whole lot of stuff.*

This geographic distance and the relatively low number of academics in the region also make it difficult for UCT scholars to set the agendas in their respective fields. As one university manager stated, "The challenge is to kind of make our issues *the* issue." For instance:

> *The EU will have this wonderful funding available, but ultimately it's their agenda. And you've got to fit in with that agenda. And how do you do it in such a way that you manage to research the issues you want to research, get the money you want and somehow play their game? It's not easy, because always it seems to be that the agenda comes from up North and then we get tacked on.*

A number of scholars reiterated this concern, at both the funding and disciplinary levels. They find it difficult to set the intellectual agenda in their field, as the power structures that shape what are considered "important" debates – especially through journal editorial decisions – are located in the global North. This reduces the type of visibility that scholars would be able to achieve if they were able to set the terms of a debate globally.

For UoM FoS scholars, by virtue of their relative isolation on an island in the middle of the Indian Ocean, as well as their political affiliation with Africa, they remain not only distant from the major population and education centres of Eurasia and North America, but lack the density of numbers necessary to shape the agendas of their disciplines. This is not something that they spend much time worrying about, but they do understand that it causes certain difficulties in collaborating with international scholars, in researching topics beyond their island, and in enhancing the visibility of their publications.

Lastly, for UNAM's FHSS scholars, the relative invisibility of African scholarship globally is upsetting, especially since many believe that this leads to their work being discounted. As one professor explained, "Africa is marginalised both in terms of funding and possibilities for dissemination and as academics from the humanities and social sciences, the knowledge they are contributing is not always seen as valid." This sentiment animates the response that many UNAM scholars have to their marginalisation by the North because, "What is important is that the North accepts us as Africans and African researchers as equal partners. This is important, that they discuss and look at our theories and our research as such with the same interest as we do."

UNAM scholars, more than any others that we interviewed, felt a sense of injustice when they considered the question of their marginality. Unlike scholars from other universities we profiled, where such North–South power dynamics have shaped their research activities for years, UNAM scholars are experiencing this in a fresh way for two reasons: first, they emerged from an intense liberation process only two decades ago and remain emotionally committed to challenging inequitable social dynamics that they face, whether politically or academically; second, now that they are starting to engage more with the globally competitive world of scholarly research and dissemination, they feel insistent that they should be considered equal partners with their Northern peers in these endeavours. They have not become habituated to this state of affairs.

However, as the institution ages and scholars continue to experience this marginality, it will be interesting to see whether they accommodate themselves to this stubbornly persistent reality or whether they continue to agitate for greater recognition from their Northern colleagues. As a practical measure, the fact that they are investing in local communication channels, such as their own journal and IR, suggests that they do not plan to challenge their marginality in verbal terms alone, but through meaningful action as well, by creating communication channels that promote their own perspectives.

Contradictions

In addition to the challenges listed above, the scholarly communication ecosystems at these universities and faculties are also beset by a number of contradictions, those elements within the system that hinder it from operating optimally, usually in a directly oppositional manner. Unlike challenges, which are typically obstacles that emanate from broader social, political or financial contexts, contradictions emerge from within the activity system and can be remedied from within it.

The primary mechanism by which we identified contradictions in our research sites' scholarly communication ecosystems was by assessing them through the Cultural Historical Activity Theory (CHAT) triangles that we employed during our change lab workshops. This was an intensive process (discussed in Chapter 2) that allowed SCAP and the academics to explore every node of their activity systems, evaluating whether there were any misalignments (contradictions) in them that could be addressed.

Some of the contradictions we identified were likely temporary by-products of some of the universities' transitions from teaching universities to research universities. In this period of flux, new tensions and stresses have been placed on the scholarly communication ecosystem, placing a number of processes in opposition with each other. But these contradictions could become more permanent if they are not dealt with soon. Ideally, these contradictions would stop forming obstacles in the activity system and rather perform as "productive tensions" that lead to higher levels of research productivity, innovation and dissemination (a concept we will explore below).

In this section, we analyse five key contradictions currently impacting these various scholarly communication ecosystems: articulation vs implementation; open vs closed communication; teaching vs research vs administration vs practice; quantity vs quality; prestige vs relevance; and scholar-to-scholar vs scholar-to-community/government communication.

Articulation vs implementation

The two universities that possessed "centralised" institutional cultures (strong at UB, weak at UoM) have both produced useful research strategies and policies for rewarding and incentivising research (and, to a lesser extent, dissemination), but in many ways, these were not translated into meaningful action in the scholarly communication ecosystem.

For instance, one of the reasons why SCAP was keen to work with UB was its impressive level of policy development regarding research production and open access dissemination. For instance, after producing a short policy document in 2002 signalling its desire to become a more research-intensive university, it produced a bevy of policy documents in 2008 detailing how it planned to become a fully fledged research university by 2021. This coincided with the roll-out of policies for its open access IR. The collection of associated policy documents is thorough, imaginative and far-sighted, anticipating issues that will emerge over time as the institution grows into a research role.

Yet these well-articulated policies have not delivered their intended outcomes for two key reasons. First, they are the product of managerial processes that failed to secure sufficient academic staff buy-in. Because of this, many scholars have actively resisted such policies which they claim are meant to enhance the prestige of the administration. This belongs to the discussion above concerning the managerial institutional culture, but these specific instances show the unexpected ways in which that debate takes place. Even useful policies which would genuinely enhance scholarly communication are targeted for resistance by scholars who feel disempowered and alienated with each new managerial dictate.

Second, these policies lack effective enforcement mechanisms, making them feel more like optional guidelines for the academic staff. This is compounded by the fact that the admin-istration has burdened itself with a number of obligations that it needs to fulfil before scholars can even start to comply with the policies. Thus, for instance, the UBRISA policy calls for academics to self-deposit their work onto the IR, but only after they receive train-ing. Yet according to the scholars we interviewed, this had not occurred.[150]

Moreover, because there are no positive incentives (such as money or PMS points) to induce scholars to submit their materials to the IR, nor are there any penalties (such as docked PMS points) for failing to comply with the IR submission policy, the IR does not achieve what it was meant to. In fact, in this instance, the administration has left the process to the librarians who have started to populate the IR by "harvesting" UB scholars' outputs from journal publishers' websites. When strategic goals such as open access dissemination are achieved in this way, it does not lead to a self-sustaining open communication culture.

At the University of Mauritius, while the administration has not yet written a commu-nications strategy for the research its scholars produce, it has developed useful strategic plans covering a number of related areas, including research production, innovation and development. The two primary documents are the UoM Strategic Plan 2006–2015 and the UoM Strategic Research and Innovation Framework (SRIF) 2009–2015 (discussed in Chapter 4). Both of these documents align university strategy with that of the national government, which wants to see local research feed into industry and innovation. Thus, the core mission of the university is "the creation and dissemination of knowledge and

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150 According to an academic who attended the one and, at the time of writing, only UBRISA training meeting, scholars never received the training they were supposed to because it turned into a debate about whether scholars should get paid for this extra work of depositing. This outcome also meant that they scholars never learned the skills that they needed to train other members of their departments.

understanding for the citizens of Mauritius" which it plans to achieve through fostering "research to sustain economic development and growth" (UoM 2009).

Unfortunately, while many of the guidelines provided in these strategy documents are desirable, and would contribute to achieving the university's goals, they are not yet implemented. For example, from the SRIF:

- Research prizes in recognition of outstanding accomplishments in research.

From the UoM Strategic Plan:

- Encourage staff by providing performance-related incentives/rewards scheme.
- Create alternate paths for promotion.
- Give credit for projects involving community development.
- Partner with community sector organisations to further socially desirable goals.

These are notable proposals and would go a long way in helping the university to realise its research and innovation goals. But the fact that they are not implemented begs the question whether the university has the capacity or political will to do so. As we have mentioned before, the university has recently gone through a difficult leadership transition which unsettled any consistency that might have developed in implementing these strategies in the past. Indeed, most scholars felt that these strategies are now in doubt until a new VC chooses whether to adopt them as his/her own, or whether to establish new ones.

The problem going forwards will be trying to develop a coherent, integrated dissemination policy to complement the various research and innovation strategies while at the same time assuring that, once written, they are implemented consistently.

Open vs closed communication

One of the starker contradictions in UB's scholarly communication ecosystem concerns the misalignment between the university's IR (UBRISA) and the official UB website. On the IR, UB scholarship is showcased to the world in an OA manner; on the website, UB scholars and their work are rendered essentially invisible in favour of official mission statements, managerial organograms and secretarial contact details. One platform is open, the other essentially closed.

As the UB Academic Staff (2012: 6) report on the state of the university reveals:

> *The University of Botswana website fails academic staff members as it does not allow them to place their (full) profiles online as is the case with other universities (even those from poorer countries than our own). As a result, our visibility on the net is next to non-existent. Universities are ranked on the basis of good university websites where staff members periodically update and showcase their new research and teaching activities online. As a result, UB is invisible online and therefore receives poor ratings.*

Visitors to the site do not get a sense of the kind of intellectual power that a department has nor of its research strengths. More worryingly, this approach fails to leverage the kinds of benefits that come from public profiling: students can seek out professors with similar interests, staff can highlight their contributions to a field and scholars outside UB can see who they might want to collaborate with on a research project at the university.

Many academics feel this level of administrative rigidity is unnecessary. As one scholar said, "The UB Public Relations department controls websites, so scholars cannot change their web pages without great effort – they feel infantilised by this level of control, which they don't see at other international universities." Another scholar complained, "We don't have individual websites, we don't have faculty websites, we don't have departmental websites. We have only one university website which does not have anything to do with us [scholars]. It has everything to do with governance: who is in power, who is the director, how many sub-directors do they have, whatever."

But the management's tight control of the site has also made academics sceptical of the administration's motives for creating the IR, something that, in theory, would enhance individual scholars' reputations. Yet even though the IR profiles their work, they felt it to be a mechanism for promoting the university administration, not themselves.

This cynical view offers a way of making sense of the apparent contradiction between the "closed" website and the "open" IR: while the former shares institutional and departmental mission statements and the latter shares academics' outputs, neither offers any detailed information about the staff who fulfil those missions or the faculty who produce those outputs. Their individual personalities are submerged under a broader (monolithic) collective "UB" identity.[151] In a managerial institutional culture, this approach makes sense, as it accords the administration the primary role in determining the configuration of that institutional identity.

However, while this communication strategy is consistent with the aim of reproducing managerial power, it contradicts the administration's own stated desires of basing its scholarly communication policies on openness, collaboration and innovation.

In some ways, this contradiction mimics the differences between the Web 1.0 approach to internet communication (static, owner-controlled websites "delivering" information to passive consumers) and the Web 2.0 approach (dynamic, user-influenced websites "cross-sharing" information between active co-constructors). UB's official website is a classic Web 1.0 artefact, well-suited to its managerial sensibilities. But the new technologies that it hopes to employ to raise its prestige (such as the IR) call for a more open, dynamic, and responsive approach to both content producers (UB staff members) and users (students and global visitors). The fact that the management has utilised the same techniques for managing the UB website as UBRISA has made scholars disinterested in submitting their content to it.

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151 Even on the IR, where a faculty member's name is attached to his or her paper, there is no corresponding personal profile to which one could link to find out more about the author.

This contradiction will not end soon, as it belongs to a broader debate taking place at the university concerning the virtue and viability of the managerial system (UB Academic Staff 2012). Thus while the university continues to invest in impressive technologies to enhance its scholarly communication potential, the challenges surrounding the questions of power and strategy will likely continue to impact the effectiveness of these technologies.

Teaching vs research vs administration vs practice

As part of their job obligations, Southern African scholars are typically supposed to teach, conduct research and provide service to the community (institutional, academic and local/national). However, in periods of transition for a university – such as between a teaching and research mission – which obligations should be accorded greater importance can become unclear. At UCT, research clearly trumps teaching and service; however, because the Comm faculty is made up of both traditional academics and professional practitioners (in industry), some feel pulled in too many directions at once, which impacts their work. At UoM and UNAM, scholars feel that their "real" obligation is still to teach, but that their "official" obligation (by which they are assessed) is to publish research. This makes for an awkward balancing act as they also feel pulled in two directions, a fact that compromises their work in both respects.

At UCT, the administration is highly responsive to changes in the global university ranking system. However, ranking systems tend to play up the aspects of scholarly activity that can be easily measured and compared – such as levels of published research output in WoS-rated journals – rather than those that are more difficult to quantify, such as the quality of teaching or the level of engagement with society or industry. For the UCT Comm faculty, which has long had a strong tradition of teaching, research and practice (with industry), the pressure to focus more on research has proved to be a challenge for those in professional fields where teaching, training and industrial engagement are more important for their students than their research outputs.

Many Comm students will use their skills in a practical, applied manner in the future (as, say, accountants), thus a good portion of the Comm faculty's efforts must be to train practitioners of a specialised craft. This means that teaching has a central place for the staff, especially for members in professionally oriented departments such as Accounting. It is through their students who go on to become employed practitioners that many Comm faculty leave their most lasting mark in higher education. Indeed, because of this, the College of Accounting is judged by a different set of criteria than the rest of the Commerce faculty.

Second, in other departments, such as Economics, faculty members are primarily assessed by their published research contributions to the field. They teach and engage with the broader discipline of economics, of course, but research holds pride of place in such a department, and it is becoming increasingly important in every other department.

Lastly, there are faculty members in both Economics and Accounting who hold industry positions as well, who teach and research at the university while also working for, or

consulting with, operational business firms. These are practitioners who bring their experience to the classroom, but for whom the academic identity is a partial one.

These contrasting pressures and motivations play a dynamic, and usually positive, role in driving academic activity in the faculty, but many scholars (especially in Accounting) believe that they are being forced to take on a greater research role which will negatively impact their ability to teach or engage with industry. One of the key reasons this is important is because, as one academic noted, "For us, new knowledge actually happens in the business world, and as accountants we react to that. Because we say, 'well, this is a new type of financial product or new type of transaction, how would we do the accounting for it?' A lot of the guidelines are developed outside by institutions and best practices and professional bodies."

Moreover, research outputs do not provide the same financial incentive that industry engagements do. As one scholar explained, "We've got this conflict: if you do more teaching, you get paid; if you write a textbook, you get paid; if you get consultancy, you get paid; if you do research, you get nothing. Why would you then do research?" She continued, "There's a big conflict between working here, having to research, having to do these outputs vs working in commerce and industry, not having to do research and earning double or three times the salary."

Thus the Comm faculty, which includes both academic and professional departments, incorporates a variety of norms, traditions and values regarding what a scholar's optimal contribution should be. The challenge is to preserve the strength of those differences while responding to the pressures for greater research production and the need for a more open dissemination plan.

The UoM has been a teaching-oriented university for most of its history, but over the last decade it has tried to ramp up its research production so that it helps transition the country to a "knowledge economy" where Mauritius acts as an "innovation hub" for the region. The FoS has been central to that transition, producing about 80% of research outputs at the university. However, while the university has identified strategies for enhancing research production, it has not reduced its commitment to the teaching enterprise. This has led to a challenging situation for many academics who feel that they are still expected to be full-time teaching staff while at the same time dealing with new research demands. Because teaching remains the core service that academics provide to the university, they feel torn between these two duties.

For many scholars, the teaching load means that there is simply not enough time in the day for research. As one shared, "When you do 270 hours of lectures and other hidden time spent on teaching activities, there is not much time left for writing papers." For others, the mental and emotional toll of teaching renders them unfit for productive research activities:

> We have 270 hours annually [to teach]. And the tutorial and practical, the
> number of hours are divided by two. So if you do ten hours of practical, it would
> be counted as five hours. So it means that sometimes you can be doing something

like 325 hours annually, so when you have done three, four, give hours a day, you're burnt out, you don't want to write something.

In sum, "Teaching requirements impact on research massively. We have far too much teaching to do … We don't have teaching assistants as well to help us."

However, teaching is not the only burden. The amount of time FoS scholars say that is taken up by administrative work also hinders their research opportunities. We heard multiple respondents say that "red tape" was reducing their research effectiveness. As one scholar stated, "You have to go through too much paperwork [to do research and accomplish normal academic tasks]." He then offered a real example of how these bureaucratic requirements impact daily activities:

My technician wants a document spiral bound, but he has to write a letter – going through the Head of Physics, going through the Dean of Faculty, going up to the Registrar and then coming back – for him or her to do the spiral binding. It's absurd. You take this document, you go outside to the shop which is next to the university and pay 25 rupees, but to do that in the university, you have to go through this.

Part of the reason for this situation is simply the accumulation of bureaucratic processes that centralise power while at the same time decreasing efficiency. But another part of the reason is that, despite the large administrative staff numbers at the university, they are not located in positions that help academics with their own administrative needs. "We have to do everything ourselves. It's very heavy administration, which is a problem."

Of course, teaching and administration form a key part of an academic's obligations, but it appears that UoM is structured in such a way as to maximise these obligations over research – which it claims it is trying to encourage. However, this contradiction between teaching and administration vs research need not last forever, though to change it will require a massive restructuring effort within the university.

At the moment, this state of affairs constitutes a contradiction, but in the future, if the administration is able to align its activities with scholars, then the obligations of teaching, administration and research will simply exist in a productive tension with each other, as they do in many other universities globally.

Lastly, like most African universities, UNAM has focused on teaching undergraduate students during most of its history. (This is also true of UB, which experiences this contradiction, but our discussion of UNAM will suffice to make the point about this tension in the various activity systems). In Namibia, that focus is now changing – or at least expanding – to include the training of graduate students at UNAM and a greater emphasis on the production of research outputs by the staff. It is still early days in this process; however, many staff see this transition as a fraught experience with teaching and research existing in competition with and isolation from each other. They do not yet feel that both teaching and researching are equally important components of their work, but

that the new research requirements have been simply piled on top of their heavy teaching schedules, placing teaching and researching at odds with each other, not in tandem.

A number of academics suggested that there was an imbalance between these enterprises, with teaching remaining prioritised in reality. As one scholar noted, "The move from a teaching-focused university to a research-focused university is also part of the problem – some lecturers see themselves as glorified high school teachers. Moreover, being the only university, there is a strong national imperative to teach."

This reality is compounded by the simple fact that there are not enough staff members to handle the teaching loads: "This [reallocation of teaching time] is not happening. The major problem is that we are short-staffed. We have got this formula, teaching some 60%, research [30% and service 10%]. We are not keeping that. I think teaching is 80%, research is 20%. Something like that."

This notion of being completely defined by their teaching loads was echoed by others as well: "I agree that there's still really a big problem here. The university is trying to do something about it so that they can reduce the teaching load, but just because of the shortage of teaching staff, you just end up teaching a lot. We are looked down upon by other academics from other universities. Every time they ask me, 'how many hours a week do you teach?' I tell them and they say, 'What?! It's like you are in a secondary school. This is not a university.'"

Indeed, the general consensus was that their core responsibility was to teach a full load each semester while research had to be considered in light of this primary obligation. The fact that there were often staff shortages meant that this obligation would not shift soon. Yet "most of us lecturers really feel that the teaching load is just too much. It doesn't leave us enough time really to do research. Most lecturers are overloaded."

Moreover, others suggest that administrative obligations are also weighty, hindering research efforts. Indeed, UNAM was the only university we engaged where scholars self-reported spending a greater percentage of time on administrative work than research. "I think there is not only teaching here. Some of them have to do administration work, which is even more now." Indeed, "there's a lot of administration that needs to be done. Most academics serve on several committees within the department."

UNAM's management is aware of this problem, with one administrator explaining that "we might not have that luxury of having a university which we can say, per se, this is a research university. We have a mixture of both [teaching and research]."

But some suggest that, for the truly ambitious, there are ways around this contradiction. "You find that even people with a high teaching load, they still publish. You know, you come here weekends, Saturdays, Sundays, holidays, you find the same type of cars out there [in the parking lot, of the staff doing research work] … It requires a lot of dedication … There's a teaching load, yes, but also maybe with a little bit of determination and commitment, it's still doable." This is an important sentiment, that if scholars made other certain types of sacrifices, that they could achieve their research

goals as well. But the key question is whether a strong research culture could ever be built on such a massive sacrifice (of family time, weekends, holidays and so forth). It is likely unsustainable and thus only partaken of by the most committed individuals.

This suggests that UNAM scholars currently experience the teaching and research missions as contradictory, not complementary. They understand the value of research to the teaching process and enjoy bringing their new knowledge to the classroom, but they also understand that, while the management may want to become more research-oriented in the future, the institution is still largely structured according to its long-held teaching obligations.

This dichotomy between teaching and research is not a timeless or static contradiction, but rather a temporary challenge that is the product of the institution's transition from a teaching-focused to a more research-focused university. At some point in the future, UNAM scholars will hopefully experience these dual imperatives as part of an integrated whole, not as compartmentalised features of their work lives. But in the meantime, university scholars and managers must continue to negotiate the difficult terrain of this transition period.

Quantity vs quality

In an ideal situation, scholars would continuously produce a large number of high-quality outputs. In reality, there is often a trade-off between the speed or volume at which scholarly outputs are produced and the quality they can achieve.

At UB, everyone would prefer to have both, but FoH scholars agree that they are currently being incentivised to focus on quantity over quality. Many suggest that the annual performance assessments create an incentive just to produce anything to "get the box ticked" at evaluation time. This can, understandably, lead academics who are pressed for time and resources to focus more on just getting it done than on ensuring that it reaches a certain standard of quality. This notion is reinforced by another scholar who said, "PMS leads to low-quality outputs because there is constant pressure for regular outputs – also, big efforts like books are not weighted much more than journal articles."

This focus on quantity may be due to the fact that the research mission is relatively new to the university, thus the management may feel that it is more important to get scholars in the habit of producing outputs, regardless of quality at this point. In any event, the PMS does offer greater points for outputs published in "high-impact" outlets such as WoS-rated journals, but for most scholars, they do not have the time to aim for those highly selective publications. To satisfy the minimum demands of the PMS, they are incentivised to produce quick, short pieces for publications that have high acceptance rates.

Because of this, many UB FoH scholars do not factor in quality considerations when choosing the journals or publishers that they engage. For instance, in our interviews, not a single FoH member mentioned Impact Factor as something that they considered when choosing which journal to submit their work to, a consideration that one would have expected to hear mentioned (even if as a low priority) by at least a few scholars if they

were concerned about "quality". This is reinforced by the fact that a number of scholars reported authoring or editing books that were published by so-called predatory publishers (i.e. publishers that claim to provide academic support services – such as peer review, editing and proofreading – while in reality offering only some, or none, of them, yet then requiring the scholars to pay for the outputs to be "published".)[152] The UB FoH scholars themselves did not see these publishers as "predatory" and were largely unaware of the debates surrounding them. This suggests that, when pressed by the institutional demand to produce publications, many scholars will seek the path of least resistance and go for publishers that are distinguished not by quality, but simply by accessibility.

While this tension between quantity and quality exists at every university, and is experienced by every scholar personally, it is often a productive tension, one that pushes scholars to find a balance between their research efforts and their values. At UB, scholars describe this tension not as a creative one, but as a contradictory one, where they have to choose between one or the other. As mentioned above, this may simply be a temporary feature of the university's transition to a research mission, but it may also become the foundations of the type of research culture that UB builds over the next decades (one that rewards quantity over quality). Whatever the case, both the management and the staff must remain keenly aware of the type of research environment they are creating with their policies and actions.

Prestige vs relevance

With the move to a research mission for many Southern African universities, the prospects of increasing their relative prestige regionally or internationally have become a real possibility. As our discussion of rewards and incentives showed in Chapter 5, most of our universities were keen to incentivise scholars to produce high-Impact Factor research that would raise the prestige of the institution. They were to do this while at the same time remaining committed to producing research that was socially and developmentally relevant to their countries. While some institutions, such as UB, have managed to strike a balance between these two desires – for both prestige and relevance – others have struggled to find equilibrium.

For instance, by almost any measure, UCT is the most prestigious, highest-ranking university in Africa. It has earned this reputation through the sustained production of high-quality research and the employment of world-renowned scholars, scientists and doctors (including the highest number of NRF- and A-rated scholars in the country currently).[153] A number of further factors contribute to this reputation, but perhaps key among them is that UCT has, both during the apartheid and post-apartheid eras, sought

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152 Jeffrey Beall, a librarian at the University of Colorado Denver, keeps a list of what he regards as "predatory publishers" on his *Scholarly Open Access* blog. Despite criticisms of certain aspects of his methodology for determining what counts as a predatory publisher, his list is regarded as the most authoritative at the time of writing. It was clear from our discussions with UB staff that few were aware of this list, nor of the implications of dealing with publishers on this list. See: http://scholarlyoa.com/publishers/

153 UCT has the highest number of NRF-rated researchers and A-rated researchers of any university. It currently has 416 (of 2,471 total) NRF-rated researchers, including 33 A-rated scientists. The University of Witwantersrand comes second with 16 A-rated scientists and about 250 NRF-rated scholars. See DIRCO (20 September 2013) SA home to Africa's top two universities, available at: www.dirco.gov.za/dircoenewsletter/newsflash76-20-09-2013.html; and Kemantha Govender (9 April 2013) UCT records highest number of NRF-rated researchers in SA, *Research SA*, available at: http://researchsa.co.za/news.php?id=1453

to conform itself to the standards and values (autonomy, liberalism, etc.) of the globally dispersed but Northern-dominant Anglophone academic community which plays a normative role in adjudicating "excellence", "quality" and "prestige" in higher education.

Indeed, for universities in Africa, prestige is largely gained through the successful comportment to Northern-derived norms and standards about what should define a tertiary institution. As the Times Higher Education rankings methodology suggests, this includes measures such as the number of WoS-rated journal articles produced by the university's academic staff, the number of citations those outputs supposedly obtain (their Impact Factors), the university's industry income and its level of "internationalisation". It does not necessarily include more abstract metrics such as the institution's developmental impact on the local community.[154]

At UCT, this achievement has encouraged the administration to strive for even greater international recognition. This is a largely beneficial goal, as one manager explained, because "it means that you can attract top quality academics and top quality international students, the more highly ranked you are." In many ways, the quest for and achievement of prestige and recognition has a snowball effect, leading to yet more prestige, recognition and opportunities for the university.

But the administration's quest for prestige can appear to be an unproductive preoccupation at times. For instance, when UCT dropped 10 places – from 103rd to 113th – in the Times Higher Education (THE) World University Rankings in October 2012, a top director quickly sent out an email to the university community explaining that the management was both "delighted" and "disappointed" by the results. He stated that he was "enormously proud" of the university for its "achievements" and that "this kind of fluctuation is not a worry." But this sentiment was later undercut that day when he sent a second communiqué which suggested that, if one looked at the scores of the various categories making up the total final score, the THE figures showed that UCT had actually improved.[155] The result of this impression management effort was that it revealed that the university believed that the THE rankings were extremely important, that they were worth dissecting in detail (reinforcing the ranking's credibility) and that the administration was indeed worried about the university's drop in them.

This episode shows the difficult position that administrators are placed in when trying to justify their institutions' "performance" based on arbitrary standards set elsewhere. Such rankings – while influencing to some degree how the public perceives universities' value and prestige – are based on criteria that may or may not have anything to do with what a particular university believes is the best way to achieve its own mission or to assess its

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154 See the Times Higher Education World University Ranking's Methodology, available at: www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking/methodology

155 As the statement read, "In fact, UCT's scores rose over the year in all but one of the system's measurement categories." It was only in one category – "industry income" – where UCT's score fell from 97.5 points to 87.3 points (weighted at 2.5% of the total score), thus negatively impacting UCT's ranking more than was perhaps necessary. Thus, when seen in this light, UCT's retreat in the rankings was not to overshadow the key point that "our ranking remains a measure of consistently high international standing and reputation."

own performance. In this case, the administration does believe in key elements of what the rankings purport to rate, that of research excellence and productivity (prestige).

But the administration also knows that other key elements that it treasures – such as an Afropolitan identity or the production of research that is socially relevant and applicable in the local context – is absent from the rankings' criteria. Thus the university's sensitive response to its fluctuating fortunes in the rankings inadvertently reifies the rankings, a questionable outcome. As one manager stated, "The issue remains to what extent should the universities be pushing in that way if the criteria for a ranking are not conducive to contributing to the country in an appropriate way."

The contradiction between prestige and relevance at UCT goes much deeper than the preoccupation with public rankings, however. Through their internal reward and incentive structures, most UCT faculties continue to encourage the production of scholarly outputs in high-ranking journals, not because they are likely to have an increased social impact, but because they will then earn a high Impact Factor (which also influences many university ranking systems).

Of course, the desire for prestige need not conflict with the desire for relevance, but there is a danger when it starts to become the "real" measure of the university's value in its own eyes. What should simply be a productive tension between two values can end up becoming a distracting contradiction pushing the administration to set goals according to externally defined criteria rather than locally meaningful ones.

Scholar-to-scholar vs scholar-to-community/government communication

As an extension of the discussion above, one of the key factors in the prestige vs relevance debate is how scholars communicate their research. In general, they are incentivised to communicate with other scholars through peer-reviewed publication channels, such as journals, books and conference proceedings. This scholarly exchange is crucial for the development of knowledge and the adjudication of ideas, but it is characterised by a long feedback loop in terms of when those ideas contribute to broader social, industrial or governmental discourses. Even when research could benefit community or national development, research outputs often remain trapped in the scholar-to-scholar communication nexus because they are inaccessible to non-academics who lack journal subscription access and who may be excluded by the discourse. Only after a long period of peer engagement do the key ideas emerge from that debate to shape other sectors of society.

For many debates, this is unproblematic. The long feedback loop assures that only the highest-quality ideas – which are eventually accepted as "knowledge" – emerge from the academy for public consumption (at least in theory). But in many cases, a shorter feedback loop would be more beneficial for communities, industries and governments, who seek fresh ideas to enhance development and promote innovation. If scholars were incentivised not only to produce outputs that are read by their peers, but outputs that are read (and "readable") by non-academic constituents who can use that knowledge in their own activities, they would increase the reach and impact of their research.

For instance, UCT scholars are primarily rewarded for producing articles, books and book chapters in high-ranking publications. They are not, however, incentivised to publish those outputs in OA journals (which would allow non-academics to read their research), nor are they encouraged to "translate" their work into accessible formats, such as briefing documents for government or civil society bodies. They receive minimal recognition for these efforts, thus if they do happen to produce such "alternative" outputs, it is often because they were asked to do so by a fee-paying consultancy or a funding agency, not because it forms part of a consistent, strategic approach to dissemination.

Hence, many scholars do have some experience in writing for a broader audience than just academics. Through consultancy work for industry or government, they take their rigorous academic research and write it in a way that their partners can understand and utilise. But these are thought of as "once-offs", not part of a typical scholarly communication approach.

Many UCT Comm scholars also admit that they feel less confident writing for non-academic audiences, in part because they were never trained to do so. For them to be interested in producing more alternative outputs, they would require training or, better yet, assistance.

Despite these challenges, the potential for UCT academics to communicate with the broader public – especially civil society groups, industry and government – has never been greater because of the open platforms that they can utilise to share their research. Rather than just aiming to reach other scholars, they can now increase the number of constituents that respond to their work. This is not without its hazards, especially since much academic work is so specialised; however, it would be a mistake to think that no one outside the academy could understand or leverage that work. Only through open communication can the "law of unintended consequences" serve to increase the potential utility of an output as different audiences respond to it in light of their own needs.

At UoM, the strategies that have been developed by the administration – based on national policy guidelines – seek to encourage research that is developmentally relevant, industrially and commercially viable and politically useful (for policy purposes). This ambition takes research far beyond the confines of the academy and reaches out to new audiences in the community, in industry and in government. However, it is one thing for scholars to produce research that would be relevant for different audiences, but quite another to communicate that research with them. It is much easier to want scholarly work to speak to broader community, industry or governmental needs than it is to develop the incentives, structures and opportunities for that to occur.

At the moment, the university's promotion guidelines favour the production of scholar-to-scholar outputs through books, journals and conference proceedings. While policy briefs, reports and op-eds – the types of outputs that are most likely be read by non-academics – are given mild recognition in the promotion policy, this recognition is not at the level that would change the traditional scholar-to-scholar focus of research outputs.

Moreover, aside from senior scholars who have developed a reputation for expertise in their fields, many FoS scholars do not know how they would begin to share their specialised knowledge with non-academics, even if that knowledge was useful to them. They often have no training in how to write accessible briefs, reports or op-eds. Nor do they know how to get in touch with the relevant governmental or community liaisons who would be interested in their work. Essentially, platforms for connection between scholars and these other audiences would need to be established, especially between scholars and community leaders and also government leaders (as the university already has a formal office for connecting scholars with industry partners).

The challenge for the university will be to accept the value of this type of communication beyond the academy. After all, it is scholar-to-scholar communication that determines the prestige and success of UoM in the eyes of international peers. But it would be useful for the university to try to shorten the traditional feedback loop where possible by encouraging scholars to communicate their work beyond the academy to a broader set of audiences. Such a shortened feedback loop would help Mauritius to become a hub of innovation as it desires.

Opportunities

With the above challenges and contradictions in mind, it is now important to consider which aspects of these Southern African universities' scholarly communication ecosystems are working well. The CHAT methodology allows us to do this because it not only shines a light on an ecosystem's contradictions, but illuminates areas of alignment (thereby allowing site members to leverage them and improve the functioning of the system as a whole). This is not only strategically sensible, but also allows us to move beyond any sense of Afro-pessimism that can start to creep into a discussion about African universities' "challenges" and "contradictions". In fact, these universities are already making crucial strides in the field of scholarly communication.

In this section, we identify promising alignments that arise from an analysis of the four university faculties' activity systems. We will do so by looking at the opportunities afforded by their institutional cultures, research infrastructures, reward and incentive structures, open access commitments, gateway statuses, virtuous funding cycles, e-infrastructure tools, innovation-focused intermediaries and quality assurance (QA) processes.

Institutional culture

Institutional cultures tend to cut both ways, presenting both challenges for an optimal scholarly communication ecosystem and opportunities for enhancing it. Here we can nuance our understanding of the image of the institutional cultures discussed above.

For instance, despite the challenges that a managerial institutional culture portends for an academic community that desires some degree of autonomy and independence, most UB academics are familiar with and accepting of their top-down leadership structure. Indeed, many Batswana would say that they have benefited greatly from a similar form of "pater-

nalistic" national leadership (Holm 1987) that was able to steer them from severe poverty and illiteracy at independence to relative prosperity and opportunity today (Sebudubudu & Botlhomilwe 2012). Thus, though UB academics have a number of concerns with the university management, they also understand how a strong, centralised structure offers opportunities that a decentralised authority would not.

First, one of the benefits of a strong administration is that, if the leadership embarks on a wise course of action, its decision can have a broad, positive impact on the entire institution. Take the university's decision to embrace an open access ethic in its UBRISA operation guidelines in 2008. This would have been much more difficult to achieve if power were distributed across the institution and located in, say, the faculties. Moreover, a strong progressive leadership can overcome the objections of "conservative" faculty blocks that reject new research imperatives and the trend towards open scholarly communication.

Second, because the management is connected with the national government through politically appointed staff (such as the vice chancellor), the administration can play a powerful role in encouraging the production of research that benefits the broader Batswana community. Rather than allowing scholars to chase "prestige" at the expense of "relevance", the management can play a role in supporting efforts by scholars to produce and disseminate research that will make a difference locally.

Third, though academics often feel that the administration is a bloated entity placed on top of them, a strong administration could play a much more robust role in arguing for a greater role of the university in driving national innovation and research. Rather than just managing academics, the administration could seek to turn its gaze outwards, pushing for a greater role in development with the government. It could act as a booster of the intellectual talent at the university, promoting its virtues and leveraging academics' abilities. For the moment, the administration appears to be corralling academics so that they abide by the terms of their job descriptions rather than seeking to connect them with government ministers, NGOs and community leaders. This is an opportunity that a strong administration could take, however, to represent and promote actively the interests, insights and innovations that the UB staff have to offer.

At UCT, as was noted earlier, two elements characterise its institutional culture: power is decentralised, existing mostly at the faculty and individual levels of the hierarchy; and peer expectation is the most important factor driving research production. With a relatively autonomous and empowered academic staff operating in an environment of constant peer pressure to produce research outputs, it is not the desires of the administration that define this institution but rather the collective ambitions of the scholars as expressed through their faculties.

But the institution's "collegial" culture does not mean that it is not also highly competitive and comparative. Indeed, as discussed earlier, UCT scholars and administrators are constantly comparing themselves to their international colleagues (often through rankings), competing for attention in a global knowledge exchange. This is good news for two reasons.

First, this is a highly efficient ecosystem for producing research, requiring far less bureaucratic energy than other ecosystems defined by either managerialism or absolute autonomy. Peers regulate each other's behaviour in a collegial environment, goading and encouraging each other to produce yet further research, in comparison to other systems where such inducements must come from a strong centralised administration or from scholars' own fluctuating sense of motivation. But when research production relies too much on external (managerial) or intrinsic (individual) motivators, resistance (to an overbearing central administration) or disinterest (as a result of flagging personal desire) in the research enterprise can ensue. While UCT scholars face the same kinds of personal motivation issues as scholars elsewhere, their buy-in and participation in a peer-regulated research-driven environment gives it a sustainability and consistency that is difficult to match in other types of institutional environments.

Second, the competitive nature of this environment means that, even though many UCT Comm scholars appear locked in a "traditional" way of disseminating research, they nevertheless remain aware of the activities of their peers who might be experimenting with new open communication approaches. Though most scholars at UCT have not been "early adopters" of open communication methods, they are certain to embrace them if open access becomes the globally dominant norm. Indeed, the administration is already in discussions about how to engage with open access going forwards. Hence, a competitive environment is a responsive environment, a key element that will shape the future of scholarly communication at UCT.

Finally, regarding young UNAM, its developmental mission remains strong. Scholars and managers are animated by the contribution that they feel they can make to the nation through their education work at the institution. The university administration, as well as many scholars, hold a close association with the government, keeping their developmental mission in line with national strategies and policies. As one manager noted, "not all research is determined by these ideas, but we try to align our research agendas to the National Development Programme to put the goals in the country … so in a given situation, there is a possibility that they can contribute to social development."

This alignment with the government's purposes coincides with university leaders' desires to enhance the quality of the institution according to global academic norms, resulting in a practical responsiveness to both local and international standards. As a manager explained:

> There's a very strong feeling in the university – in the strategic objectives the university has set for itself – to serve society and to be there as part of the development of the nation, and to use academic learning, research and teaching towards the development of the society as a whole. So that's a dimension that I think universities in the First World don't have, in the North, in the same way. And as the university has developed over the past 20 years, the introduction of new faculties has really been based on what the country needs [such as law, medicine and agriculture]. So it's quite a close link between the university and the broader development needs of the country. A lot of the research is quite solution-driven. That may be different from other contexts.

Thus while the university is gaining greater awareness of its comparative place regionally and globally (through rankings, etc.), it still assesses itself primarily by how it is contributing to national development, a very local standard of measurement.

Another key element of UNAM's institutional culture concerns the way in which senior scholars act as mentors and models of exemplary research behaviour so as to build a research culture. In a context where the research imperative is relatively new, the role of "elders" in building that culture is crucial. Many senior scholars who have active research and publication profiles in the FHSS have taken on this role quite self-consciously while younger ones (or newly arrived ones from the teacher training colleges) have sought to emulate such mentors. Often, senior scholars will try to create collaborative research opportunities with younger scholars and postgraduate students so as to provide guidance during an actual project.

What's important to note about this developmental institutional culture (Bergquist & Pawlak 2008) is that power in this arrangement is not transferred in a top-down fashion (as is the case in a managerial institutional culture), nor is it lateral or side-to-side (as in an collegial culture), but it is best described as front-back, meaning that a small cohort of colleagues (who are nominally equal, but distinguished by their experience) leads a broader cohort of "followers" by example. It is these senior academics – more than administrators or peers – who are helping to build the research capacity that the university desires. This fact helps to explain why more FHSS scholars feel a sense of belonging to research networks at the university itself rather than outside of it (in comparison to the other universities we profiled, where this mentoring dynamic is not so profound).

In practical ways, this leadership is demonstrated concretely not only in these senior academics' running of committees at the departmental and faculty level, but their editorial work on the faculty journal and their participation in the SCAP implementation initiative. Indeed, to get other scholars to submit their alternative outputs for profiling on the new IR, the dean of the FHSS not only offered up all of his own work to the initiative, but personally secured the participation of many other senior scholars whom he believed would inspire younger scholars to follow suit. He understood the natural authority they possessed in this context where research efforts were still tentative.

This type of "developmental" culture – one that is responsive to the needs of the nation and built on mentoring relationships – has great potential to enhance scholarly communication within it. With all of the policy development that is now occurring at UNAM in response to both SCAP's engagement and its own desires to leverage its capacity, the university is on its way to doing just that.

Research infrastructure

One of the primary factors contributing to the growth and maintenance of a strong research culture at a university is whether it is supported by a diverse, robust and well-resourced national research infrastructure. This infrastructure consists of various national research bodies and funds which create a dynamic research environment where university

scholars can seek out multiple funding opportunities from multiple agencies, all of which are coordinated to create a strong research network. This is an important feature of the South African context and one of the reasons for UCT's solid research performance.

While Botswana and Namibia have both made tentative steps towards building up their research capacity, Mauritius provides an example of a small country with a small number of researchers that has nonetheless created an impressively diverse and comparatively well-resourced research infrastructure. For instance, at the top, it is comprised of the national-level Ministry of Tertiary Education, Science, Research and Technology (MTESRT), the Mauritius Research Council (MRC) and the Tertiary Education Council (TEC). These bodies provide multiple interfaces and funding mechanisms for FoS scholars to access for the sake of pursuing research projects. Their functions and policies are described in more detail in Chapters 3 and 4, but here it is sufficient to note that they provide Mauritian scholars with a major advantage over scholars in countries that lack these diversified research support entities. It allows them to take a more ambitious approach to their research since they are not limited to seeking funds from the stretched university research budget. For a small country, with a population the size of a medium-sized municipality in most other contexts, the scope of the government's commitment to research and innovation is expansive.

These three bodies – along with the university – have developed mutually reinforcing research policies and strategies that aim to transform Mauritius into a knowledge economy by 2025. Their impressive level of internal policy alignment amplifies their collective capacity, but it also means that their non-engagement with OA principles has essentially closed off the entire island from these global trends. While the TEC acknowledges the growing importance of open educational resources (OER) worldwide, it stops short of adopting any OER or open access principles for itself (TEC 2013: 16).

Considering the collective leverage that these bodies bring to the policies they embrace, they should reconsider whether research knowledge is best leveraged for development through the ("closed") industry-oriented patenting and commercialisation approach that it now favours, or whether research knowledge is best leveraged for development in an "open" approach (able to reach government, industry and community agents) that would help to bring about the "knowledge economy" more quickly, precisely because it involves all Mauritians in the process rather than just industry.

Rewards and incentives

While each university's reward and incentive structures offer opportunities for enhancing its scholarly communication ecosystems, UB has done more than the rest to spell out how that structure should motivate research (based on the 113-page Performance Management System manual) (UB 2008a). Though the research imperative was only recently articulated at UB, the institution has already laid out some useful strategies for rewarding research. This is done through the annual PMS assessments, the promotion review, official research awards and other discretionary arrangements. While many scholars say that they approve of these incentives in theory, they have either not yet been fully implemented or they are too narrowly focused.

One of the innovative elements of the PMS is that it allows scholars to set their own research goals (within certain limits). The UB Research Strategy states that the PMS enables "the structuring of one's professional role in terms of the proportion of time allocated to research" (UB 2008c: 10). This means that, while academics are obligated to perform their three functions – teaching, researching and service (to the university, profession and community) – they have some discretion in how they allocate the proportion of time for each. The ranges are:

- Teaching: 55–75%
- Research: 20–40%
- Service: 5–20%

Unfortunately, many academics feel that this policy is not being implemented because, while they may state that they would like to spend a greater proportion of their time on research, their teaching loads do not change (which is usually the key determinant of whether they have time for research). The percentages that they list are just notions, not an indication of their reality. Despite this, the proposal has great merit if it could be implemented in a way that is truly reflected in the scholars' work regimes. If more academics enjoyed the full 40% of research time allowed, the university would benefit in terms of greater research production.

However, the Research Strategy does spell out the opportunity for decreased teaching in one particular instance: "the obtaining of external research grants and contracts provides opportunities for release time from teaching" (UB 2008c: 10). This is given in recognition of the money that a scholar has brought into the university and for the new work that s/he will have to take on to complete the work. This is excellent, except that staff find it quite difficult to get the types of grants and contracts that would warrant their release from teaching duties, at least in the eyes of the management.

Another useful proposal that the Research Strategy calls for is the performance-related pay system where "successful research accomplishment will be recognised" through better pay (UB 2008c: 10). Considering that UB's research culture is still nascent, and that many academics see themselves primarily as teachers, the direct payment system for quality research offers an expedient stimulus for kick-starting research production. It is also a factor to which scholars themselves say that they would respond. When asked if they receive indirect or direct financial incentives for producing or disseminating research, more than 80% of our FoH survey respondents said "no". But when asked about the potential importance of such incentives, over 80% said that indirect financial rewards would be important while close to 60% said that direct financial rewards would also be important. Thus the university's exploration of different financial rewards and incentives appears suitable to pursue at this time.[156]

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156 The Best Researchers Award, involving a prize of P10,000 [USD1,010], has been in existence for five years but apparently "most professors don't apply, there is a lot of documentation involved just for P10,000 so mostly professor level people don't bother." The layer of bureaucracy (an application process) to this positive incentive ends up disincentivising it to the point of triviality.

Lastly, one of the more far-sighted elements of the PMS scoring system is the relatively high marks given to scholars who publish in "Listed National Journals which have special significance" (UB 2008a: 29). These comprise a small set of locally produced journals rated by the ORD as meeting certain standards of quality, consistency and importance. Though publication in them rates slightly lower than publishing in international journals with high Impact Factors, the university's support of them through the generous scores offered to scholars for publishing in them is crucial for the development of a strong, stable research culture. Though all admit that they would like to raise the standard, profile and level of production of the journals, they are proud of the contribution they make and are keen to continue publishing in them.

But truly to leverage the opportunity that these locally produced journals offer, the university should use its rewards system to incentivise the improvement of the journals by offering high points (and perhaps even financial bonuses) for editors who are able to produce titles on a regular basis in an OA format. Currently, even the best journals come out sporadically and are not always open access. If UB scholars are motivated not only to submit and edit articles for their local journals, but to ensure that they are published consistently and at a high quality, the confidence and level of peer expectation concerning research at the institution would rise.

Open access

All of our partner universities' administrators and scholars, except those at UCT, have expressed positive sentiments about open access dissemination, either at a policy level or a personal level. For those that have incorporated such positive sentiments into their policies, their challenge has been to make them operational. For those that simply hold positive open access sentiments personally, this can be leveraged at a practical and policy level to enhance scholarly communication (at least at the departmental or faculty level).

At UB, the ORD has written open access principles into the Digital Repository Policy (UB 2009b) with the recognition that it would take some time before it would become operational. This remained the case at the time of writing. The open access communication system had yet to be fully implemented, but UB has a massive opportunity to be a leader in the open access scholarly communication field on the continent due to its official commitment to it, its strong central administration which could enforce it and its scholars' mildly positive feelings towards it.

One scholar explained the complicated situation concerning OA at the institution and the way forwards to promote it:

> *Open access is clearly on the institutional agenda, with the development of an institutional repository and the potential for converting university journals to open access. However, more information is required in order to educate academics and practitioners on the benefits of this approach, and on the various legal considerations which need to be engaged with. Academics at UB proved reluctant to consider a mandate for the deposit of journal articles in the repository and there is a need to encourage greater levels of participation in the repository.*

Despite some academics' hesitance about the IR, the administration is supporting open access communication in other ways which are much more popular, especially through its provision of funding for the payment of article processing charges (APCs) that some open access journals charge for publication. The ORD offers varying levels of financial assistance to UB academics based on their position at the institution. As one scholar explained, "If you are a lecturer, you pay 25% [of the APC] and ORD pays 75%. If you are a senior lecturer, it's 50/50. If you are an associate professor, you pay 75%, ORD pays 25%. If you are a full professor you pay for it yourself."

UB has already taken useful steps to promote open access scholarly communication at the university, but now is the time to make sure that OA policies are implemented through incentives that create an OA sensibility amongst UB scholars.

In Mauritius, though neither the government or the university has embraced open access policies, FoS scholars are largely positive about OA's merits. They not only see the benefits it provides them when they seek other scholars' research outputs online, but they also see how it increases the download and citation rates of their own work. And while their perspective is largely shaped by their own disciplinary norms (which incorporate OA mechanisms to a certain extent), the university could leverage FoS scholars' positive disposition towards open access as it considers new research and communication strategies.

It could start by placing the *University of Mauritius Research Journal* under an OA mandate so that it would become a more attractive dissemination vehicle for scholars, raising the visibility of its own outputs. At the moment, the journal acts as a publisher of last resort for many FoS scholars, even though it could be a very powerful publication channel on the island. Part of the problem is, because not all of the journal's papers can be downloaded, it is not clear whether the journal operates according to an open access policy. It is also not curated and profiled optimally, making it less visible than it should be. And because it follows a traditional print journal format (with volumes and issues), it is failing to use internet technology in a way that would free the journal from the limitations associated with print-based production cycles. The journal could embrace open access and publish a host of different output types so that it would not only reach a scholarly audience, but all of the other audiences on the island that crave useful knowledge.

Thus, while there are serious e-infrastructure challenges to making open access communication a reality at UoM, it possesses both a positive attitude to open access (at least within FoS) and an in-house publication channel that could reach out to broader communities.

UNAM FHSS scholars are also quite positive about the merits of open access dissemination. They see the value that OA would have not only in allowing them to gain access to more materials, but in allowing more people to access theirs. They also understand its value for non-academics who seek developmentally relevant research for their own purposes, especially civil society, industry and government personnel. This is a sentiment that the university is now leveraging as it promotes new research and innovation strategies (especially in the new Scholarly Communications Policy).

UNAM leadership could also leverage this positive sentiment in how it moves forwards with the future issues of all UNAM-affiliated journals, especially the FHSS journal. At the moment, the journal is not open access. It is a popular publication channel for many FHSS scholars, but because it is not online or open access, it lacks the ability truly to impact the national community.

Thus, while there are certain e-infrastructure challenges to making OA communication a reality at UNAM, it possesses both a positive attitude to open access and in-house publication channels that could start reaching out to the communities that it has identified for targeting through its own practices. The journals could produce different genres, not just articles, enhancing their appeal to multiple audiences. But they must go OA first.

Gateway status

Most Southern African universities that seek to ramp up their research production and prestige look at boosting their number of international connections and collaborations. For instance, UB lists 62 institutions in 19 countries with which it has some sort of official collaborative relationship.[157] In UNAM's current Strategic Plan, the university hopes to raise the number of existing and operational international cooperations from a baseline of 30 to 80 by 2015, and the number of active collaboration agreements from a baseline of 14 to 80 in 2015 (UNAM 2011d: 23) These kinds of ambitions reveal how useful it is for African universities to be considered "gateways" to the continent, as international scholars, agencies and funders seek to partner with local institutions.

For instance, at UCT, one of the key benefits it receives as the highest-ranking university in Africa is that it attracts a number of collaborative opportunities with overseas academics, universities and research funding agencies. This enhances the capacity of UCT scholars not only to conduct their own original research, but to participate in international collaborations that can result in highly impactful outcomes. This is due to UCT's existing capacity to host or participate in research partnerships, and also the wide range of expertise that it possesses in certain fields.

As one manager explained, "there's lots of collaborative research [at UCT]. An American or European partner can source a grant from their richer providers and, if they're interested in Africa, they get the UCT collaborator to get access to African subjects and African data and African infrastructure. That's a very common pattern."

This presents a crucial opportunity for Southern perspectives to be incorporated into Northern-dominant research outputs and discourses. But as the "developing world" partner in these research collaborations, it remains important that UCT scholars use such opportunities not only to push the boundaries of research, but to push the dissemination of that research into the hands of communities that can benefit from it locally.

This opportunity exists as well at UoM. Some of the features that make the country marginal also make it interesting for international collaborative partners. Its remote island

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157 UB University/Industry Partners, available at: www.ub.bw/content/id/1911/pid/1751/ac/1/fac/8/University/Industry-Partners/

status, its affiliation with Africa, its unique demography and its status as a middle-income country make Mauritius an attractive site for various projects and multi-site research activities. The university is central to this attractiveness because of its solid reputation and the quality of its scholars (many of whom graduated from overseas institutions).

Many FoS academics discussed with us the international collaborations in which they have been involved. Some of them were the result of prior research connections, but many were initiated due to a foreign research project's desire to work with a UoM scholar who could do a portion of research locally that would feed into a comparative international study. Thus UoM enjoys something of a gateway status for overseas scholars seeking to collaborate with academics in either tropical island locales or Africa.

The administration is well aware of this fact and has brokered innovative partnerships with French and Indian universities regarding research and training collaborations. Ambitious researchers in FoS have also taken advantage of the opportunities this affords. With the government's desire to turn Mauritius into an "innovation hub", it appears that the university's desires are in alignment with those of the nation.

The virtuous funding cycle

When we discussed funding challenges at UB, UoM and UNAM, many scholars said that they believed that their countries should adopt the South African system in which the government rewards public universities with funding for every accredited research output that its scholars produce. We call this a "virtuous funding cycle" because it not only rewards scholars for past outputs, but incentives the production of further ones.

Indeed, UCT certainly enjoys the benefits of this generous funding system. Unlike many other African universities which suffered through the World Bank and IMF structural adjustment programmes in the 1980s and 1990s, South African universities were buoyed up financially by the apartheid government (to retain an independent intellectual resource base during the years of international isolation) and have continued to be supported by the post-apartheid government (to broaden the access that previously disadvantaged citizens have to education). Thus higher education remains relatively robust.

Two reasons why South African universities can continue to grow and innovate is because of the block grant funding system and the South African Post Secondary Education (SAPSE) subsidy system. Essentially, block grant funding comprises a percentage of the total funds given to a university by the government, with which it can do as it pleases. That is, while other funds are earmarked for particular programmes or line items, block grant funds can be used in line with the university's particular strategies. This gives a crucial degree of autonomy to these universities, allowing them to express the desires of their staff and students, not just those of the Minister of Higher Education and Training.

The second reason, which has already been discussed, is the SAPSE subsidy which is paid by the government to universities as a reward for research produced and as an incentive for the production of further research. It forms part of the block grant, thus each university has its own approach for dealing with the funds that come in through

the subsidy. For instance, some universities pay a portion of the subsidy directly into the relevant scholar's personal research budget, rewarding him/her for producing an output listed on the SAPSE list, and incentivising him/her to produce more. At other universities, such as UCT, a portion of those funds goes to a faculty-level research fund which acts as a pooled source of resources for which faculty scholars can compete. It does not go directly to the scholar who produced the output, but typically to his/her faculty research fund (though a portion may also go to the central administration for other purposes). This creates a virtuous research cycle, encouraging further research with every output produced.

Numerous scholars at UCT credit the subsidy for enhancing the conditions for pursuing research, not only through the provision of actual funds, but through the fact that scholars themselves have an impact on how much is given by the government to the university.

Moreover, because the SAPSE list of approved publications includes a number of South Africa-based journals, it has helped to solidify a strong and relatively independent publishing core in the country.[158] This forms part of the research infrastructure that SCAP has identified as being so important in productive research environments.

But while the SAPSE system has been crucial for both the production of research and the support of a locally strong research infrastructure, its potential to enhance scholarly communication in the open access era has yet to be realised. If the subsidies were tied to open dissemination practices, or if they were used to support open approaches, South Africa could become a leader in fostering a more accessible, equitable and developmental type of communication.

Innovation-focused intermediaries

Another advantage that UCT enjoys over many other southern African universities is the presence of numerous innovation-focused intermediaries that not only teach and/or conduct research on campus, but search for ways to improve both activities across the institution. These are not traditional departments, but (often soft-funded) "mode 2" units or projects that enhance the research, teaching and dissemination capability of the university.

These innovation-focused intermediaries – including a project such as SCAP – leverage the strengths of the institution while also attending to gaps between traditional disciplines. These are often creative spaces where unorthodox questions can be asked, where new ideas can be experimented with, where interdisciplinary collaboration can take place and where academics and non-academics can meet to pursue shared goals. All of these efforts feed into the lifeblood of the university, strengthening the intellectual ethos and contributing to a vibrant research culture.

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158 One manager explained the situation, but from a slightly cynical perspective: "UCT makes its money out of publications in a SAPSE-approved journal. And the amount of money that they earn is exactly the same, whether it's *Studies in Economics and Econometrics*, which is a little journal published in Stellenbosch, or the *American Economic Review*. It is exactly the same amount of cash. So, from the UCT financial perspective, [the best thing to do is publish] lots and lots of articles in easy to get into South African journals, which happen to be SAPSE-approved."

These intermediaries are able to take on certain tasks which may not yet be standard for the institution (such as running an OER platform), either because it does not have the skills or capacity to do so or because it is still deciding on their viability. Such intermediaries are becoming increasingly important in the new open access scholarly communication paradigm, providing translation, curation and profiling services.

For instance, as our implementation initiative with SALDRU revealed, the unit did not have the capacity to develop certain types of "accessible" outputs concerning its socially relevant research findings, thus other intermediaries at UCT who had experience with producing easy-to-read policy briefs – members of the Children's Institute – were called in to help produce a briefing paper on teenage pregnancy that could be circulated to stakeholders at the governmental and community levels.

Until the production of such "translated" work becomes standard for academics, they will need intermediaries to help them to broaden the reach of their research. At the moment, these intermediaries operate in an ad hoc manner concerning scholarly communication at UCT, but if they were incorporated into an institution-wide strategic plan, they would be able to have a more profound impact on getting UCT's research into the hands of those who most want or need it and simultaneously improve the institution's brand and profile.

e-Infrastructure

Though SCAP has learned that technology is not always the answer to solving an institutional challenge (even if appears to be a technological problem), certain technologies can have an expansive effect on an institution's ability to enhance its scholarly communication ecosystem. As our discussion of the various implementation initiatives in Chapter 6 showed, technologies such as IRs can help universities to curate, profile and broadcast their research outputs. At UCT, this was done through SALDRU's unit-level content repository.

However, with UB's investment in an IR, the university has radically enhanced its potential to disseminate its scholars' research to a broader audience. This is a tool that truly has the potential to optimise UB's scholarly communication ecosystem, helping scholars to achieve their goal of disseminating a broad range of scholarly objects for the sake of national development.

At its best, an IR should profile, curate and make accessible every scholarly output produced by a university's academics. Even if certain objects are bound by intellectual property constraints (i.e. under copyright of a commercial journal publisher), the IR can profile the object through metadata descriptions and link to it if it is available elsewhere. In this way, the IR can act as a "shopfront window" for the university's research production, giving a sense of the institution's intellectual contribution to the nation and the world. This has become increasingly important as governments demand that universities, as recipients of public funds, justify their actions and their value. Beyond the numbers of graduates that they produce, universities are increasingly forced to offer their research outputs as an indicator of their productivity and importance.

For the university management, UBRISA offers the platform for promoting an OA ethic. As one librarian said, the installation of the IR "was a way of enhancing access to information."

However, as UB has learned, an IR is not a politically neutral technology, nor does it run itself. To this day, many academics suspect that UBRISA is just a "prestige project to boost the image of the university management," not something for promoting the work of the individual scholars. Thus academic interest in it has been strikingly low. Yet most librarians remain positive, especially about the idea of winning the academics over to an open access principle: "there's still a need for more advocacy for them to understand the concept of open access but I think it's starting with UBRISA."

Moreover, the technological and administrative skills necessary to populate and maintain an IR are substantial, a fact which has stretched library staff beyond their capacity. Because of this, the IR has not yet lived up to its potential, but has been a relatively static and shallow receptacle for academic outputs. Nonetheless, UBRISA represents a real opportunity for UB to take some control of showcasing and disseminating its own research, especially to those outside the academy (policymakers, NGOs, community activists) who might be able to leverage this research for developmental purposes.

The other key tool that the university possesses which could enhance not only its production of local research but its open access dissemination potential is OJS software. This tool aids publishers, scholars and managers with the production of journals. To date, this system has not been utilised to its full potential, leaving many UB-affiliated journals struggling to keep up with the demands of a new digital scholarly communication paradigm. But broader knowledge and use of OJS at UB could allow for the creation of more publishing platforms that produce outputs on a more consistent basis.

An even broader ambition would be to monitor all of this research and dissemination through the university's Current Research Information System (CRIS). The CRIS has the potential to give the administration a greater understanding of the research work being done by its scholars – and also then to create an awareness of strategies to improve it – but at the time of writing, it was being used in a more limited way, mainly to track the financial pay-outs of various research grants to researchers. Yet the CRIS could do so much more in terms of rendering the university's research activity legible to the management and the government, providing them with a precise means of accounting for the public funds that the university is spending on research for development.

A similar trajectory is taking place at UNAM where, over the past two years, the university has taken great strides in securing the e-infrastructure necessary to enhance scholarly communication. First, it has redesigned the institutional website, making it more functional, dynamic and attractive. This is an important signal to the staff that the administration is serious about upgrading its presence and visibility on the internet.

Second, it has embraced a scholarly e-portfolio initiative in which scholars will have their own personal web pages where they can profile their research interests, publications, educational background and any other information that they feel is necessary for their

students or the world at large. This activity began prior to SCAP's engagement with UNAM, but because of its obvious value to the work that we were promoting, we made sure to integrate our proposals with those being developed by the scholarly profiling team as well. This has enhanced the potential of our work at UNAM and the sustainability of any visibility-raising measures that the university takes up.

Third, the administration – through our pilot initiative with the FHSS – has established an IR that will curate, profile and disseminate research produced by UNAM scholars. This does not just pertain to journal articles that scholars produce, but to all research outputs, including "alternative" outputs that are meant for non-academic audiences. What is so encouraging about this initiative is that it is based on lessons learned during a previous IR failure. A few years ago, an IR installation was established by an external agency, then run by a person in the library who had the good intention of profiling UNAM scholarship. Unfortunately, because the IR was not embedded in institutional policy and lacked certain crucial technical support (redundancy mechanisms, power surge protection, etc.), it was rendered inoperable over time, resulting in the loss of all of the materials stored on it. Once the librarian moved on to another position, the IR failed because it was not integrated into broader networks of responsibility.

This was a painful episode, but one that the administration decided to leverage rather than deny. Thus, when SCAP engaged with the university, the leadership was ready for the complex and difficult conversations that needed to happen before the IR could be re-established. At the time of writing, the IR had been embedded in institutional policy and various safety protocols ensured its longevity. The pilot process that the FHSS embarked on with us has produced numerous scholarly outputs for profiling on the IR, acting as a model for the other faculties at the university.

What is most encouraging about the establishment of these new e-infrastructure technologies is that the university is not simply purchasing and installing them. It is taking the time to prepare the institution for them, to ensconce them in policy provisions, to train personnel to administer them, and to promote them to the academic community so that its members will use them. This process should be replicated with all future e-infrastructure initiatives.

Quality assurance

While the installation of an IR increases the technical capacity of a university to disseminate its own work, many Southern African universities are concerned about the quality of the materials that are put up on it. They do not want to place every scholarly output on their repositories, but only those that meet certain quality standards. Ascertaining which materials meet the appropriate standards requires a workflow process, but it can also help to develop the university's research culture, as our experience with UB showed.

As part of SCAP's implementation initiative at UB, we developed a quality assurance (QA) workflow process that the Department of Library and Information Studies (DLIS) used to put their research outputs through prior to submitting them for uploading on UBRISA. This process had been envisaged and sketched in earlier UBRISA policy

documents, but had never been operationalised because the library (which hosts UBRISA) was still more focused on profiling journal articles that had already been peer-reviewed (and thus quality assured) rather than the many non-traditional outputs that UB scholars have also produced (such as conference papers and reports) that are not necessarily peer-reviewed. Though the management wanted that all UB outputs to be profiled on the IR eventually, it only wanted to do so if the outputs had met certain standards of quality. The process of determining that would have to fall to the UB academics themselves.

As discussed in Chapter 6, DLIS piloted our proposed QA process – which was quite similar to the one envisaged by the ORD in its UBRISA policy documents – and was able to shepherd 15 outputs through it successfully. It entailed a single-blind review process by members of the DLIS Departmental Research and Publications Committee (DRPC) who gave useful and, at times, extensive feedback to authors who were asked to make either small or major corrections before sending them to the UBRISA team.

The virtue of this exercise was that we were able to determine that a QA process could work at the departmental level (as ORD hoped) and that quality could be determined through this bespoke peer review-process (or what we called "peer-review lite"). Since all of these outputs had already been delivered to their primary audiences (at conferences, etc.), the point of this process was not to peer-review the outputs for future publication, but simply to assess whether they were worth profiling on the IR after the fact.

Due to the feedback that the authors received, those who only had to make light corrections decided to make them so that their outputs would be profiled on the IR. But those who were asked to make extensive revisions decided not to because they did not feel the outcome justified the time it would take, so those materials were not sent on for profiling.

Thus, while the process did what it was supposed to do – ensure quality by only sending those outputs which reached a certain high standard whilst blocking those that did not – it taught us and the UB staff two important things for going forwards. First, because there is no reward or incentive listed in the PMS regarding submitting one's outputs to the IR, scholars will likely only be willing to make light revisions to their work to bring it up to standard; they will not make extensive revisions. Second, this is a model that could be utilised by other departments at the university. This is the scenario that the ORD had imagined all along, but had never implemented. This pilot process shows that UB scholars could, given the right structure and incentives, raise the level of their own scholarship at the same time as embracing open scholarly dissemination through the IR.

This experience is also relevant for other Southern African universities that want to profile more of their academics' work online, but only after they have gone through an internal QA process. As time-consuming or difficult as that process can be, it can often serve to create positive mentoring relationships and stronger collegial bonds and expectations amongst the faculty members.

Conclusion

Our discussion of the challenges, contradictions and opportunities characterising the UB FoH scholarly communication ecosystem reveals an institution that is in transition. This is similar to the situation at UNAM's FHSS, as well UoM's FoS (though this last one has some unique issues due its disciplinary distinctiveness). All of them are slowly trying to ramp up their research production and make their universities centres of research excellence. This process is not without its difficulties, as we have seen. There are not only the usual teething problems that come with a change from a teaching-oriented mission to a research-oriented one, but also larger administrative debates impacting every element of the activity system. While it is often healthy for an institution to go through bouts of self-questioning – as UB is – this debate about the role and limits of the university administration is symptomatic of what appears to be a deep unhappiness amongst many academic staff members (UB Academic Staff 2012). This contrasts with UoM which would, at this point, simply be happy to have a vice chancellor stay in office for more than one year. Under these conditions, it will be difficult for the university to establish the kind of robust, collaborative and self-sustaining research culture it desires. UNAM, on the other hand, has worked well to move from discussion to action regarding scholarly communication policies. Yet, as we have shown, for all three of these universities, there are real opportunities for growth and development that scholars and managers can leverage.

Meanwhile, UCT enjoys many advantages compared to other African universities, but its ascendant position cannot be taken for granted. One of the dangers it faces concerns the legacy of its historical achievements: that is, the institution's past success may hinder managers and scholars from embracing new innovations in scholarly communication because they believe that they can continue to succeed based on the old standards that they have previously employed. Success can ironically impede development and innovation in a time of rapid change.

Another danger that UCT faces is thinking that its elite position within the country is secure. Far from it: the pronounced differences between the quality of some universities like UCT vs other universities in the country is a major cause of alarm for some scholars and politicians who believe that UCT is being unfairly advantaged, or at least unreformed racially.[159] Such inequalities, if they become politicised in a particular way, could lead to structural and policy changes at the top, negatively impacting UCT's plans.

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159 For instance, see this (factually incorrect) statement made by the ANC Western Cape Chairman and Deputy Minister of International Relations and Cooperation, Marius Fransman (12 April 2012) UCT backsliding on racial transformation, *Politicsweb*, available at: www.politicsweb.co.za/politicsweb/view/politicsweb/en/ page71654?oid=292427&sn=Detail&pid=71654; for UCT's response to this, and a fuller picture of the debate that ensued, see Rebecca Davis (20 April 2012) UCT students get stuck into race debate, *Daily Maverick*, available at: www.dailymaverick.co.za/article/2012-04-20-uct-students-get-stuck-into-race-debate/. One of the key points to take away from this discussion is that many people still ask, "Is UCT racist?" – a question that compromises UCT's ability to broadcast its own image of itself and enjoy unquestioned credibility. When such questions surround an institution, it can represent an opening for politicians to "meddle" in the otherwise "autonomous" institution, as the Fransman episode highlights. But it also opens up the university to scrutiny from all quarters: even the South African Communist Party (which forms part of the ANC-led ruling Tripartite Alliance) has suggested that UCT's VC Max Price is unduly under the influence of the Democratic Alliance (DA) – which governs the Western Cape and acts as the official opposition party to the ANC at the national level – because he is acquainted with some of its leaders. See Rebecca Davis (18 October 2013) The battle at UCT: Race-based admissions policy issue flares up again, *Daily Maverick*, available at: www.dailymaverick.co.za/ article/2013-10-18-the-battle-at-uct-race-based-admissions-policy-issue-flares-up-again/

Moreover, as one manager shared, UCT's prestige is derived, in part, from the fact it has the luxury of choosing the best students because other universities pick up UCT's slack, a situation that may not last forever:

> *When the University of the Western Cape (UWC) was making it possible for people to come into a university who would never have had a chance of getting into one, UCT was getting its A-rated research status. We were looking inwards, we were patting ourselves on the back and we were kind of working with the best students and so on. So I really do think that UCT is often blind to the extent to which other universities are making it possible for it to continue to do what it's doing by allowing it to take just the cream of the crop of the students, while the others deal with the students who are really struggling…. So we should be very mindful of the fact that they are playing a role that supports us to do what we do. And that's changing, because they're not going to do that forever. They don't want that and I think there's a strong pressure to even the load. And then, against that is strong pressure to maintain differentiation so that some universities can continue to be very high-flying research active universities. It's a debate that will go on and on.*

Thus it is important that UCT demonstrates that it is contributing to locally relevant and meaningful development outcomes, not just achieving great prestige through publications and rankings. The university exists in a national political context where accountability, equality and local responsiveness matter. This is where open scholarly communication strategies can serve UCT well, taking research that would otherwise circulate only in an "ivory tower" setting and having it reach the many civil society, industrial and governmental constituencies that could leverage that research for developmental purposes.

Chapter 8
Key findings

In seeking to answer our two research questions concerning the state of scholarly communication at Southern African universities – of Botswana (UB), Cape Town (UCT), Mauritius (UoM) and Namibia (UNAM) – and how ICTs and open access publishing models can improve that state with appropriate institutional support, SCAP has amassed a substantial amount of data on university practices, policy landscapes and levels of e-readiness. We have analysed that data in the previous chapters, but here we condense that analysis into a single chapter where we present our key findings.

Before we begin, however, it is worth foregrounding a foundational assumption concerning regional scholarly visbility that we have confirmed through our research.

➪ *Finding 1. Southern African research is comparatively marginal and invisible in the global context of academic research production.*

This coincides with the literature that shaped our initial assumption and was certainly true for UB, UoM and UNAM, though less so for UCT, which enjoys a certain level of visibility. The three national universities, however, each belong to countries with small populations, tiny higher education sectors, modest financial bases and teaching-oriented tertiary education systems, which make it difficult for them to achieve distinction through traditional academic indices (such as WoS-rated journal article production).

This general condition of marginality and invisibility is due to both external and internal factors. Externally, the wealth and productivity of Northern institutions (and increasingly other Southern ones in China) simply dwarf the research potential of the smaller Southern African countries, a fact that will not change soon. However, it is also influenced by internal factors which, if altered, could increase its reach, prestige and relevance.

In this chapter, we highlight the key findings from our research as they pertain to the four universities' research and communication practices, policies and infrastructure and capacity. These comprise the internal factors influencing the visibility of Southern African scholarship and offer points of contact for interventions that seek to improve them.

Research and communication practices

To understand the state of scholarly communication at these four universities, we focused on the research and communication practices in the Faculties of Humanities (FoH) at UB, Commerce (Comm) at UCT, Science (FoS) at UoM and Humanities and Social Sciences (FHSS) at UNAM. At UoM and UNAM, these faculty-level research sites also acted as our pilot sites for implementation activity, while at UB and UCT, pilot activity occurred in the Department of Library and Information Studies (DLIS) and the Southern African Labour and Development Research Unit (SALDRU), respectively, which were part of the chosen faculties. Because our various research instruments obtained information at the institutional, faculty and departmental levels, we were able to shed light on each in turn. Here, however, we focus on how those insights apply across all four sites so as to give some indication of how scholarly communication may operate more broadly at the regional level. Though this analysis of the four sites cannot be said to be truly representative of the entire region, it does offer suggestive insights that can be used by scholars, managers, policymakers and funders in Southern Africa. Therefore, we will be as explicit as possible about the scope of each finding so that readers can see the complexity of these nested ecosystems. In general, if a finding conforms to the majority of our institutions and scholars, we refer to that as having "Southern African" significance (with the usual caveats).

Values

To get a full picture of Southern African scholarly communication practices, we started by trying to grasp academics' motivations for conducting research and publishing their findings in the first place. Based on numerous interviews, surveys, conversations and observations with members of the four universities, we found that all Southern African scholars were motivated by both extrinsic and intrinsic factors, but when aggregated and ranked, the most powerful motivations were: compliance with the institutional mandate to produce research (UB FoH), conformity to peer expectation to produce research (UCT Comm), congruence with personal desire (UoM FoS) and the desire to generate new knowledge and enhance teaching (UNAM FHSS). While these scholars shared a number of other motivations – such as for promotion, to aid national development and to obtain indirect financial rewards – the most important motivations listed here were the products of their unique scholarly communication ecosystems.

⇨ *Finding 2. Southern African scholars are motivated to produce and disseminate research for both intrinsic and extrinsic reasons, including: the institutional mandate (UB FoH), peer expectation (UCT Comm), personal desire (UoM FoS) and to generate new knowledge and enhance teaching (UNAM FHSS).*

These differing motivational factors make sense in their given contexts. UB scholars' high responsiveness to an institutional mandate is understood in a context where teaching has long defined scholars' identities and the administration's centralised managerial culture has guided academics' actions. The mandate has served as a crucial mechanism for encouraging scholars to incorporate research into their work. UCT scholars operate in a competitive, comparative and collegial context where there is a high peer expectation to produce research. It is the product of a strong research culture that has been developed

over decades and supported by substantial resources. UoM scholars work under an administration that is highly centralised, but also quite weak, so they are free to choose how productive they want to be in terms of research. Thus their activity is shaped primarily by their personal desires. Meanwhile, UNAM scholars work in a developmental context which is both young and teaching-oriented, thus they are motivated to produce research to generate new knowledge and to enhance their teaching.

However, despite our initial assumption that all scholars would want to produce and disseminate their research, we soon learned that not all Southern African scholars want their work to be visible.

⇨ *Finding 3. Not all Southern African scholars want their research to be visible.*

For a number of personal, social, cultural and professional reasons, some academics at UB, UoM and UNAM (but not UCT) revealed that, though they want their research production to count towards their performance assessments, they would prefer that their research – or at least some portion of it – remains unseen. The reasons they give for this stem from:

- anxieties about quality, peer judgment and community exposure (especially if they doubt the value of their research contributions)
- a culturally informed sense of modesty (where it is considered improper to engage in self-promotion, such as calling attention to one's own work)
- a minimalist communications strategy (where dissemination is achieved through reading a paper at a conference, or perhaps allowing a journal to publish it, but nothing further)
- fear that others may steal their ideas/data (especially if still in gestational form)
- a teaching- rather than research-oriented approach to scholarship (which speaks to one's sense of academic identity, as a teacher rather than a researcher).

While most Southern African scholars are keen to share their research with the world, it is crucial to remain cognizant of the reasons that some would have for hiding their work, as a number of these rationales are likely to be relevant in marginalised, postcolonial settings in which academics face significant resource and access constraints.

Research production

Most Southern African scholars say that they spend the majority of their time engaged in teaching-related activities (timetabling, prepping, lecturing, marking, advising, invigilating, etc.). They also say that they shoulder significant administrative duties. This was certainly the case at UB FoH, UoM FoS and UNAM FHSS, though most UCT Comm scholars were able to balance their research and teaching activities more equitably. Such heavy teaching and administrative requirements would be reasonable at institutions that still see themselves as teaching-oriented universities, but for these that seek to become more research-oriented, the high teaching and administrative demands hinder their universities from achieving the objectives of their new research-informed missions.

⇨ *Finding 4. Heavy teaching and administrative loads hinder research production in Southern African universities.*

This finding conforms to the image presented by other studies of African higher education which show that scholars across the continent are burdened by similar challenges. The simple lack of time available for carrying out research has a massive impact on whether African scholars can pursue research projects, or whether they can do so with any regard for quality and consistency.

However, for the scholars who are able to make time for research, many claim to face serious funding hurdles, especially at UB, UoM and UNAM (and less so at UCT). Many scholars are unable to source funding for their projects, either international or locally, while those who can must rely mostly on the limited funds that their universities offer.

⇨ *Finding 5. The majority of Southern African research projects are either unfunded or funded by their universities.*

Considering that the four universities that we profiled were some of the more prolific in the region (each was the top producing university in their respective countries) and belonged to countries that had moderate financial resources (especially as compared to their neighbours), the challenges of research funding are likely much greater across the rest of Southern Africa.

The result of this unfunded and university-funded research is that scholars must try to achieve their research aims with limited financial resources. This impacts the size, scope and ambition of the kinds of research projects in which they engage.

⇨ *Finding 6. Many Southern African research projects are small, local projects, confined to an immediate geographical area.*

One way in which Southern African scholars try to overcome this limitation is by participating in consultancy research, an opportunity in which their universities encourage them to engage. Though consultancy work can often draw scholars away from their primary research interests to attend to those of their funders, it can sometimes compensate for doing this by allowing scholars a chance to engage in empirical research and contribute to projects that may have national development potential. The major problem, however, is that these consultancies are often bound by strict confidentiality clauses, disallowing them from publishing their results.

⇨ *Finding 7. Consultancy research often offers Southern African scholars their only opportunity to do empirical research, though they are rarely able to leverage it to boost their scholarly profiles through academic publication.*

Outputs

Every university recognises research outputs differently, weighing each according to the values that it is trying to promote through its scholarly performance assessment system. At universities such as UCT, scholar-to-scholar outputs in high-prestige publication channels (WoS-rated journals, etc.) are prioritised far above outputs aimed at other audiences, while at more development-centred universities such as UB and UNAM, reward and incentive structures encourage scholars to produce a diversity of outputs aimed at local and international audiences, scholars and non-scholars.

⇨ *Finding 8. Scholars at prestige-oriented universities in Soutern Africa are incentivised to produce high-Impact Factor scholar-to-scholar outputs while scholars at development-centred universities are encouraged to produce a wide variety of scholarly outputs that can reach multiple audiences.*

One of the inadvertent challenges that results from this for the development-centred universities is that they sometimes struggle to build their academic cores because their scholars are rewarded for outputs that do not necessarily require fresh, empirical research. Because they are less challenging to produce than peer-reviewed high-Impact Factor scholar-to-scholar outputs, it can take a longer time to build up the kind of robust research cultures that universities desire. This does not mean that it will not happen, just that it may take longer.

⇨ *Finding 9. Many Southern African universities produce a lot of outputs that are interpretive, derivative or applied (rather than the product of fresh, empirical research), due in part to institutional reward structures and funding challenges.*

During this build-up phase towards a more dynamic research culture, this focus by Southern African academics on such outputs is perhaps inevitable. Indeed, it may be more important at this time for universities to focus on simply increasing the production of outputs by its scholars, creating greater research capacity so that, in the future, more academics will be able to engage in high-level, empirical research. For the moment, however, many Southern African scholars will feel pulled between quantity and quality, between producing outputs to satisfy an external requirement and producing outputs that might have an impact on their field.

Communication

While the Southern African scholars we engaged were quite interested in finding ways to increase their research productivity, they were far less responsive to the changing communication opportunities that new ICTs offer for disseminating their work. For the most part, they confine their communication activities to traditional modes. At UB, UoM and UNAM, that would often mean reading their papers at regional or international conferences, sharing drafts with colleagues who request copies, incorporating insights from their research into classroom teaching or submitting their

articles for publication in journals. At UCT (and to an extent at UoM as well), this would mean producing scholar-to-scholar outputs to be published in high-Impact Factor journals, books and conference proceedings. While the open access movement and availability of free online tools have expanded the opportunities for individual academics to profile their work on the internet and seek out collaborative partners, most Southern African scholars have yet to take advantage of them.

⇨ *Finding 10: Most Southern African scholars do not utilise social media technologies in their scholarly work because they lack knowledge about them, training in how to leverage them and the time to be able to incorporate them into their research and dissemination practices.*

This means that Southern African scholars typically rely on face-to-face contact for disseminating their work, or they leave it to commercial publishing firms to handle. They usually do not have a strategic dissemination plan that leverages the online platforms that would give greater visibility to their outputs. Nor are they encouraged to do so by their universities, as they receive no rewards or incentives for publishing in open access journals or profiling their work on institutional repositories (IRs). One of the consequences of this is that Southern African research often does not reach the audiences that could most benefit from it, such as government policymakers, development NGOs or community leaders.

⇨ *Finding 11: Southern African scholars rarely communicate their findings to government.*

This is compounded by the fact that few universities in the region have open access policies that would increase the likelihood of their scholars' outputs reaching such "stakeholder" audiences. Some of the reasons for this include scholars' caution about open access (especially at UCT and UB), scholars' lack of outputs to make available in the first place (such as at UNAM) and the impact that disciplinary communication norms have on whether open access is feasible.

⇨ *Finding 12: Southern African scholars' perception of open access dissemination is influenced by personal, historical, cultural, disciplinary and economic factors.*

Networks and collaboration

Southern African universities are characterised by highly variable levels of connectivity institutionally, nationally, regionally and internationally. Even though most universities desire to enhance their networks and number of collaborative engagements, each university's network profile is quite unique.

At UB FoH, scholars say that they do not communicate with each other much (due mainly to a lack of time and fora for doing so), though they enjoy reasonable levels of connectivity with regional and international scholars (with whom they meet at conference events). UCT Comm scholars are highly networked within their faculty and internationally, but not so much with non-faculty members in their own institution. They also enjoy good connections with non-academics – such as civil society and industry personnel – as their work has applicability in a variety of contexts. UoM FoS

scholars do not collaborate much with each other or others in the country, but enjoy extensive networks overseas (where most scholars who share their research specialisations are located). At UNAM FHSS, many scholars do not feel part of any type of research network or community yet, but those who do enjoy solid levels of connectivity within their faculty and internationally.

⇨ *Finding 13: Southern African universities desire greater levels of collaboration, but each institution is characterised by highly variable levels and types of scholarly connectivity.*

Despite these universities' drive to become more connected with other universities, many face significant financial and practical obstacles in pursuing research collaborations, especially with African partners who themselves must deal with their own constraints. Thus, for a number of reasons, they often end up collaborating with Northern-based research projects that require an "African partner".

⇨ *Finding 14: Southern African scholars typically find it easier – for financial and practical reasons – to collaborate with scholars in the global North than in the rest of Africa.*

Research culture

The research, communication and networking conditions in the region have developed what we can call "nascent" research cultures at most Southern African universities. Aside from UCT, which boasts a comparatively strong research culture, UB, UoM and UNAM are still in the process of building up their research cultures. While these universities are taking important strides in developing a more robust academic core based on new research missions, its completion will take time.

⇨ *Finding 15: Most Southern African universities have "nascent" research cultures.*

This description is warranted for the three universities because:

- there is a low level of networking, collaboration and communication between colleagues, even within the same faculty space
- there is a low sense of peer expectation regarding collegial research production (i.e. colleagues do not put pressure on each other to publish)
- there are comparatively low participation rates in journal review editorial boards, meaning that scholars are not shaping their fields as much as following what others are doing
- there is no national research body in Botswana that could spur greater research opportunities for faculty members, nor a national research fund (yet) in Namibia, where scholars can go if they fail to get univerisity funding, or if they need large amounts of money to pay for ambitious research projects. (This is, however, available in Mauritius.)

This description is likely to change in the future as these universities continue to invest further resources in their research missions, and as the national governments build up research capacity through the establishment of research foundations, councils and funds.

Policy

Southern African universities enjoy varied levels of policy development, not only in terms of their research strategies (which are relatively well established) but also in terms of their communications strategies (which are largely undeveloped and only now receiving attention). How these policies are established and enforced, however, is often the result of the kinds of institutional cultures that define policy-related activities.

Institutional culture

The diverse histories, ages, demographics and missions of Southern Africa's universities have given rise to a multiplicity of institutional types whose dominant characteristics help us to understand the implicit norms of their scholarly communication ecosystems and how managers and scholars operate within them.

UB's institutional culture is managerial, in that it has a strong, centralised authority that wields power in a paternalistic, top-down fashion. This concentration of power has been useful in helping to speed up the process by which the entire institution falls in line with the new research mission and the open access ethic that the administration has (partially) embraced. But it has also bred resistance by faculty members who feel that their voices are not being heard by the administration and that its various initiatives (such as the institutional repository) are for the glory of the administration, not the benefit of the academic staff. This means that even good ideas lose credibility if the process by which they were initiated is viewed cynically.

UCT's institutional culture is collegial, in that power emanates from the faculties, individual scholars enjoy great autonomy and intellectual freedom, and the central administration is highly responsive to its academic staff. This is useful in that most of the policies that are eventually adopted enjoy great legitimacy because they are the product of extensive consultation across the institution. But the downside is that, because scholars operate in faculty silos, it can take a long time for otherwise good ideas (such as open access) to be adopted, especially if disciplinary norms militate against them.

UoM's institutional culture is bureaucratic, in that is characterised by a highly centralised administrative structure that is nevertheless quite weak. Thus, on one hand, the administration employs a variety of bureaucratic processes which ensure that even the smallest decisions made by academics refer to the administration for official approval ("red tape"), thereby centralising authority within the institution. But on the other hand, it has largely vacated the strategic role that it should play in shaping the policies structuring research and dissemination activity, leaving scholars on their own to decide how much research they would like to conduct and how to communicate it.

UNAM's institutional culture is developmental in that leadership is not centralised (in a managerial fashion) nor decentralised (in a purely collegial sense), but is distributed across faculties where senior scholars (or "elders") act as models that exemplify good research behaviour to others and, in turn, develop their capacity. These senior

scholars often occupy positions of leadership in faculties, departments or committees, distinguishing themselves by their solid research and publication records. It is they who lead by example, often mentoring junior scholars in the process. Power in this system is not top-down (managerial) or side-to-side (collegial), but front-back (developmental).

⇨ *Finding 16. Southern African universities are shaped by diverse institutional cultures: UB's is managerial, UCT's is collegial, UoM's is bureaucratic and UNAM's is developmental.*

Each of these cultures inspires different reactions from the academic staff when new proposals, such as open access, are considered.

Open access

Southern African scholars have varying sentiments about open access, but within our study, UoM FoS and UNAM FHSS scholars were the most positive while UB FoH and especially UCT Comm academics were the most cautious. The Mauritians' support was largely due to the fact that open access strategies resemble their normal scientific communication practices, thus they had a practical appreciation for it (as opposed to a moral one). Namibians were keen for open access not only for the benefit they could get from it as information-seeking scholars, but because they also saw how, if their outputs were made freely accessible, other Namibians would benefit from their research. However, despite these sentiments, neither of these faculties' members went out of their way to disseminate their work in an open access fashion because they did not receive any institutional recognition for doing so.

⇨ *Finding 17. Southern African scholars who support the notion of open access communication are no more likely than their less responsive colleagues to disseminate their work in an open access fashion if they receive no institutional recognition for the effort.*

The UB administration has tried to respond to this challenge proactively by incorporating an open access ambition into its institutional repository policy and by providing financial support for the payment of scholars' article processing charges. However, other policies undercut these efforts because they do not provide any material or symbolic incentives for embracing open access practice. This ambiguity is reinforced by UB FoH scholars' own sense of ambivalence about open access due to concerns about intellectual theft and the loss of indigenous knowledge protections.

A similar lack of enthusiasm exists for many UCT Comm scholars who remain unconvinced of the merits of open access in general. Many do not buy into the arguments for open access, preferring to stick with the traditional mode of relatively "closed" communication on which they have succeeded in building their careers.

⇨ *Finding 18. Some Southern African scholars remain unconvinced by the arguments for open access dissemination, preferring to stay with the traditional mode of communication that has benefited them in the past.*

Infrastructure and capacity

These findings have stressed the importance of motivational systems and policies because, for the most part, the universities we dealt with already possessed the technology necessary to optimise scholarly communication (or at least the resources to procure those technologies).

UB had an institutional repository, UCT had multiple subject repositories scattered across the institution and UNAM previously had an institutional repository which it was keen to revive. Only UoM lacked the kinds of technologies that one would expect to find at an institution serious about scholarly communication.

⇨ *Finding 19. Many Southern African universities already possess the technologies necessary for optimising scholarly communication.*

Perhaps because UB and UNAM had both undertaken an institutional repository installation in the past, they had relatively robust communication policies. In contrast, UCT and UoM – neither of which have institutional repositories – do not have such communications policies, a fact that negatively affects their abilities to use the technologies that they do possess. At UCT, different units, departments, centres and faculties possess websites or servers for profiling their content, but they do not abide by the same technical protocols (meaning that they are not interoperable) and they often have no relationship to each other. They're ad hoc efforts, typical in a decentralised institutional context; but they lack the benefits of contributing to a broader cohesive, strategic purpose.

Capacity

Despite the generally solid levels of capacity at these Southern African universities, they do not enjoy consolidated expertise on new forms of scholarly communication. Such expertise exists in pockets, often in the form of "institutional champions" who are spread across the universities and do not necessarily hold any formal title or institutional mandate in this regard. One of the reasons for this is that it is difficult to identify where this activity should be located, developed and nurtured.

⇨ *Finding 20. Expertise on new forms of scholarly communication exists in pockets dispersed across universities, creating challenges in developing a coherent, integrated strategy for institutions.*

A crucial implication of this going forwards is that, because Southern African universities usually do not yet have a cohesive institutional research management system able to generate research output data and associated bibliographic detail in an efficient or appropriate format, it is difficult for them to explore various alternative metrics tools for research evaluation, thereby limiting their ability to account for their research activities in a collective fashion and to demonstrate their value to the public.

⇨ *Finding 21. Some Southern African universities' investment in traditional, Impact Factor-driven approaches to research evaluation – combined with the challenges of surfacing institutional data on both traditional and new output genres – hinders the adoption of new methodologies for assessing "impact".*

But even if these universities wanted such technologies or software management tools, they would have to approach them with great care, lest they end up accumulating a lot of expensive, sophisticated technologies that they do not have the skills or capacity to utilise. We encountered this problem on a number of occasions where technologies had been purchased or obtained through donation, but were never integrated into the institutional or policy context. They were simply inserted into a scholarly communication ecosystem without a full understanding of how they should fit into it. For new technologies to reach their full potential in these academic environments, all of the various institutional stakeholders must determine who "owns" and who "administers" such e-infrastructure, and whether the relevant staff are capable of integrating it into their workloads.

⇨ *Finding 22. The inclusion of new technologies into a scholarly communication ecosystem often requires extensive and continued retraining of support staff.*

Research infrastructure

Lastly, Southern African universities which form part of a diverse and well-resourced national research infrastructure enjoy significant advantages over those that do not. Most Southern African universities do not enjoy such high levels of political, administrative or financial support, a fact which limits the kinds of research activity local scholars can engage and even imagine pursuing. In Botswana and Namibia, research infrastructure is only now starting to develop, while in Mauritius it is quite well-established (though the amount of money available for it remains modest).

South African universities such as UCT, on the other hand, enjoy robust governmental support in the form of the National Research Foundation, the block grant system that allows universities great discretion over their own expenditure, and the South African Post Secondary Education (SAPSE) subsidy which rewards and encourages scholarship with further funding. This enhances the opportunities that scholars have for sourcing funding both at the university and at the national governmental level.

⇨ *Finding 23. Southern African universities which form part of a diverse and well-resourced national research infrastructure enjoy significant political, administrative and financial advantages over those that do not.*

At UCT, that platform also benefits from the diversity of research groupings – in faculties, departments, units, centres and schools – that are often soft-funded, but provide a crucial extension of research capacity for the university. These groups can be called "innovation-focused intermediaries" because they are often able to ask questions that go beyond traditional disciplinary boundaries and engage with broader audiences than just other academics because of their civil society, industry and government

connections. Moreover, they can connect university academics through research translation, curation and profiling.

⇨ *Finding 24. Southern African universities would benefit from the presence of innovation-focused intermediaries that extend the value, utility and reach of academic research.*

With these findings in mind we offer, in the next chapter, our recommendations for enhancing scholarly communication in Southern Africa with strategic proposals for leaders in national governments, for university managers, for scholars themselves and for research funders.

Chapter 9
Recommendations

To optimise scholarly communication at Southern African universities, there are four stakeholders that can play a dynamic role in improving universities' dissemination activity: national governments, university administrations, university academics and research funding agencies. Each of these groups contributes to research and communication practices at the institution, thereby impacting the potential visibility of Southern African scholars' research outputs. In this chapter, we provide recommendations tailored to each of these stakeholders with a focus on enhancing research production, open dissemination and regional collaborative opportunities.

To national governments

Build a national research infrastructure

- *Establish a national research foundation* so that scholars can seek local funding from more sources than just the university research budget. Use that foundation as a platform for providing larger grants than the university provides so that scholars can embark on more ambitious, original and empirical research projects.

- *Design a virtuous research funding cycle* (similar to the SAPSE subsidy system in South Africa) in which, for each recognised output produced by a scholar and disseminated in an open access fashion, funds are directed into that scholar's university for the sake of both rewarding and incentivising the future production of research.

- *Provide funds for open access research dissemination*, such as through an article processing charge (APC) fund.

- *Require that all publicly funded research be made open access.*

To university administrations

Enhance the institutional research culture

- *Grow the university research budget* so that it meets and accelerates the demand for research funds by scholars.

- *Offer a reduction in teaching time* to scholars who demonstrate ambitious research activity.

- *Establish digital platforms for sharing publication success* by university scholars. Use website profiles, email circulars and other communication opportunities to tell stories that develop a positive, supportive collegial environment in which research, open dissemination and peer expectation (the social pressure to engage in research) is prized.

Incentivise open dissemination

- *Develop an open access policy which mandates that all publicly funded research be made open access*, either through publication in open access journals or through the payment of article processing charges in traditional journals. Increase the recognition of outputs that are disseminated in an open, rather than closed, fashion.

- *Base performance assessment of scholars' outputs on what they deposit or profile in the university's institutional repository* (if one is in place).

- *Run university-affiliated journals on the Open Journals System and make them open access*.

- *Induce academic staff to create personal profiles on their departmental web pages* in which they include a biography, research interests, classes taught, memberships and publications.

- *Explore the utility of altmetrics* – or a related complementary metrics system – by providing scholars with data from institutionally curated and profiled outputs.

Provide support services for scholarly communication

- *Establish or identify support service providers who can translate scholars' research* for government and community-based audiences (e.g. condensing journal articles into accessible policy briefs).

- *Develop a network of communication officers/content managers* so that disparate dissemination activity can be pursued in a more cohesive and strategic manner.

- *Encourage scholars to share their research insights (and bibliographic references for them) on Wikipedia* so that university research can reach a broader audience.

- *Invest in training for library staff* so that they can operate effectively in the new, open scholarly communication landscape.

- *Pressure consultancies to make as much of any contract research usable by academics* for their own scholarly outputs.

Enhance the department-level research culture

- *Explore developing a quality assurance workflow process (at the department or faculty level) to allow scholars to improve the quality of their outputs* (prior to depositing them on an institutional repository).

- *Reduce administrative duties for academics – such as registering students and invigilating exams – to an absolute minimum* to free them for academically productive pursuits. Allow graduate students to handle such tasks, if possible.

- *Train and incentivise scholars to use Web 2.0 platforms* so that they can share the responsibility of making their own research more visible.

Leverage regional expertise

- *Collaborate in the construction of short-term regional exchanges for administrators and librarians.* This would allow them to be immersed in other contexts in which they can learn new skills and approaches through interaction with senior hosting staff members. They would be responsible for producing an output from their experience and sharing it with staff members at home.

- *Invest in regional journal production opportunities.*

- *Incentivise regional research collaboration* through enhanced funding and recognition for SADC-based activities.

To university scholars

Raise personal visibility

- *Share responsibility with the administration for research visibility.* Communicate research findings to the communities that the research may concern but also to the audiences that could best leverage it for developmental purposes. Ensure that it is published through an open access channel.

To research funding agencies

- *Include a plan for capacity-building* at Southern African universities where technological interventions are envisaged. Do not assume that staff members in the region possess the same skills or job descriptions as those with similar titles elsewhere.

- *Determine the feasibility of developing a regional megajournal.* Prepare costings for launching one new open access megajournal (in the style of *PLOS ONE*). The study should include consideration of: how to provide publishing services (hosting, editorial services, peer review management); researcher interest and willingness to take on the new challenges involved; readiness of research funders to support the venture in terms of cash and support for the principle and the practicalities involved; and how this journal can be made viable and how it should be sustained and supported.

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SCHOLARLY COMMUNICATION IN AFRICA PROGRAMME

African scholarly research is relatively invisible globally because even though research production on the continent is growing in absolute terms, it is falling in comparative terms. In addition, traditional metrics of visibility, such as the Impact Factor, fail to make legible all African scholarly production. Many African universities also do not take a strategic approach to scholarly communication to broaden the reach of their scholars' work.

To address this challenge, the Scholarly Communication in Africa Programme (SCAP) was established to help raise the visibility of African scholarship by mapping current research and communication practices in Southern African universities and by recommending and piloting technical and administrative innovations based on open access dissemination principles. To do this, SCAP conducted extensive research in four faculties at the Universities of Botswana, Cape Town, Mauritius and Namibia. SCAP found that scholars:

- carry heavy teaching and administrative loads which hinder their research productivity
- remain unconvinced by open access dissemination
- find it easier to collaborate with scholars in the global North than in the rest of Africa
- rarely communicate their research with government

- engage in small, locally-based research projects that are either unfunded or funded by their universities
- produce outputs that are often interpretive, derivative or applied due, in part, to institutional rewards structures and funding challenges
- do not utilise social media technologies to disseminate their work or seek new collaborative opportunities.

All of these factors impact Africa's research in/visibility at a time when scholarly communication is going through dramatic technical, legal, social and ethical changes.

Seeking Impact and Visibility shares the results of SCAP's research and advocacy efforts. It not only analyses these four universities' scholarly communication ecosystems, but illuminates the opportunities available for raising the visibility of their scholarship. It concludes with a series of recommendations that would enhance the communicative and developmental potential of African research.

This study will be of interest for scholars of African higher education, academically-linked civil society organisations, educationally-affiliated government personnel and university researchers and managers.

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