

African Universities in the Knowledge Economy: A Collaborative Approach to Researching and Promoting Open Communications in Higher Education

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Abstract

This paper will describe the informal collaborative approach taken by a group of donor funders and researchers in southern and eastern Africa aimed at consolidating the results and increasing the impact of a number of projects dealing with research communications and access to knowledge in higher education in southern and eastern Africa. The projects deploy a variety of perspectives and explore a range of contexts, using the collaborative potential of online resources and social networking tools for the sharing of information and results. The paper will provide a case study of donor intervention as well as analysing the methodologies, approaches and findings of the four projects concerned. The paper will explore the ways in which the projects and their funders have had to address the issues of the global dynamics of knowledge, of the changes in research practices being brought about by information and communication technologies; and of the promises that this could hold for improved access to knowledge in Africa. Finally, the conclusions of the paper address the complex dynamics of institutional change and national policy intervention and the ways in which a collaborative approach can address these.

Keywords digital scholarship; knowledge ecology; open education; open access; scholarly publication

1. Introduction

For our continent to take its rightful place in the history of humanity ... we need to undertake, with a degree of urgency, a process of reclamation and assertion. We must contest the colonial denial of our history and we must initiate our own conversations and dialogues about our past. We need our own historians and our own scholars to interpret the history of our continent.

President Thabo Mbeki – launching the South Africa-Mali Timbuktu Library Project

When it comes to access to knowledge in higher education institutions in African countries, the emphasis has tended to be, in the first instance, on the difficulties that African researchers face in gaining access to expensive commercially published journals and books, and the extent to which this disables African participation in the knowledge society. John Willinsky is but one of a number of authors who have described the dismal circumstances in which African researchers work, with empty library shelves and minimal

access to international resources. He also describes some of the initiatives that have been put in place to remedy this situation, such as the negotiation of special journal packages by the International Network for the Advancement of Science Publications (INASP) and the World Health Organisation.

On the other side of the coin are the difficulties experienced by African scholars in publishing from their home countries, also described in some detail by Willinsky [1] [2]. These are not only problems of resources, of funding for paper and printing, of the difficulties of print distribution or computer availability and bandwidth [3], but also of the power dynamics of international scholarly publishing, a more neglected topic. Developing countries, especially in Africa, face a broad spectrum of research infrastructure and capacity constraints that limit their capability to produce scientific output, and absorb scientific and technical knowledge. Unequal access to information and knowledge by developing nations , exacerbated by unequal development and exchange in international trade, serves to reinforce the political and cultural hegemony of developed countries. The impact of knowledge-based development will continue to have insignificant impact as long as this asymmetry in research output and access to up-to-date information remains [4].

There is no doubt that when it comes to participation in the global knowledge economy, Africa is particularly badly represented. According to a 2002 survey by the African Publishers' Network, Africa produces about 3% of all books published, yet consumes 12% [5]. The statistics are even worse when considering Africa's contribution to the internet. In 2002, Africa produced only 0,04% of all online content and, if one excludes South Africa's contribution to this, the figure fell to 0.02% [6]. When it comes to journal publishing, the power dynamics of this commercialised global sector is clearly demonstrated. In 2005 there were 22 African journals out of 3,730 journals in the Thomson Scientific indexes. Twenty of these were from South Africa. The major Northern journals account for 80% of the journals in the Thomson Scientific indexes; just 2.5% overall come from developing countries [7].

Given the overwhelming social, economic and political problems that so many African countries face, the major need is for the production of locally relevant research to be effectively disseminated in order to have maximum impact where it is most needed. This is skewed in the global scramble for publication in the most prestigious journals as African scholars and their universities seek to establish their rankings in a competitive global research environment [8] [9].

The situation in most African countries has been compounded by decades of IMF and World Bank structural adjustment programmes, based on Milton Friedman's theory that economic growth is generated through investment in primary education, while higher education creates unrest and instability [10]. This has led, in most African countries, to the decimation of higher education infrastructure and the virtual destruction of research capacity. South Africa is much better off in terms of research capacity; however, the higher education sector faces complex challenges as it addresses its transformation needs post-apartheid.

Ondari-Okemwa [11] categorises constraints specific to knowledge production and dissemination into economic (inadequate funding and budgetary cuts, lack of incentives, brain drain) technological (internet connectivity and telecommunications infrastructure) and environmental factors (freedom of expression). Kanyengo and Kanyengo [12] identify the non-existence of information policies for handling information, poor ICT infrastructure to manage the preservation of knowledge resources, inadequate financial resources and the lack of technical knowledge and legal barriers as the key impediments to preserving information resources as inputs into knowledge production.

Where there is agreement is that one of the major priorities for addressing Africa's development challenges,should be knowledge production by African researchers working primarily at African institutions, focusing on locally relevant knowledge production. According to Sawyerr [13], this insistence 'on African research and researchers at African institutions is to ensure rootedness and the sustainability of knowledge generation, as well as the increased likelihood of relevance and applicability. This condition presupposes local institutions and an environment adequate to support research of the highest calibre; and insists upon

the rootedness of such research as well as its positive spill-over effects on the local society'.

2. Policy contradictions

The policy framework that lies behind these projects has been described in Eve Gray's paper on research publication policy in Africa produced for an Open Society Institute (OSI) International Policy Fellowship. This revealed fault lines and contradictions in South Africa's well-elaborated research policy, which were reflected in policy developments in the region. Broadly speaking, polices that impact on research dissemination veer between an emphasis on the public role of the university, which demands social and economic impact in the national community, and an international role that is framed in the discourse of a competitive system of citation counts and international scholarly rankings. The former places the emphasis on the knowledge society, the use of ICTs and open and collaborative approaches to research; the latter on individual effort, proprietary intellectual property (IP) regulation and monetary returns garnered through the leverage of the university IP in the knowledge economy[8]. As Jean-Calude Guèdon points out, these two terms are not co-terminous: This is something that is eloquently explored in a recent paper by Jean-Claude Guèdon, who points out that 'the universality of scientific knowledge differs fundamentally from its globalisation' and that 'it is clear that the present situation of access to scientific publications arises less from aspirations for a 'knowledge society' but rather from the rapacity of a 'knowledge economy' [14].

One effect of the latter strand of policy is – strangely, given the emphasis on the need for national development impact – a remarkably narrow conceptualisation of what constitutes research publication. Peer reviewed journal articles, books, chapters in books and refereed conference proceedings are valued and supported in a region that, given the serious developmental challenges it faces, could learn from the efforts of the Department of Education. Science and Technology (DEST) in Australia to grapple with a broader conception of what could constitute effective research publication, given the opportunities offered by ICT use in a changing research environment [15].

3. Donor collaboration

This paper will review the ways in which a group of projects in southern Africa are seeking to address these issues through informal collaboration by donor funders seeking to maximise the impact of their interventions. Discussion of this collaboration started at the Workshop on Electronic Publishing and Open Access in Bangalore in 2006. This workshop recognised the potential for collaboration between second economy countries as a power base for change and was attended by delegates from India, Brazil, South Africa and China. This recognition of the importance of collaboration spilled over to tea-break discussions about the fragmentation of donor interventions in southern Africa and the need for a consolidated and co-ordinated approach. In response, a group of funders and researchers – from the OSI, the International Development Research Council (IDRC) and the Shuttleworth Foundation – subsequently met at the iSummit in Dubrovnik in June 2007 to take this idea further. The decision was that the funders would map their various projects in consultation with one another in order to try to achieve a consolidated impact in the transformation of policy and practice for the use of ICTs and open access publishing to increase access to knowledge in Africa. The projects that have emerged from this informal initiative thus consciously cross-reference one another in the pursuit of these goals, contractually requiring that research findings be made freely available through open licences, and also sharing project resources and findings through the use of social networking tools. This has already proved effective, as the projects have shared literature surveys and reading lists; have exchanged findings; have collaborated in interviews and workshops; and

have used collaborative workspaces and online discussion forums to exchange ideas and track common areas of interest.

4. The projects

This paper will describe four open access and scholarly publishing projects currently included in this collaborative effort, charting the ways in which they impact on one another and how their findings could coalesce to create an impact greater than the sum of their parts. These projects recognise that the achievement of shifts in policy and practice in an environment as conservative as the university sector and as sensitive as the under-resourced African higher education system needed a multiple-pronged approach, working at all levels of the system – institutional, national and regional – to change entrenched policy and practice. A complex approach would have a better chance, this collaboration suggests, to deliver a substantial shift, leveraging the potential of ICT use and open access publishing models, to transform the delivery of African knowledge dissemination. The projects all focus on the production of African knowledge from Africa, for African purposes, rather than the question of access alone.

These projects also all share a contextual understanding of the need to take into account the changing research and teaching environment that has resulted from the impact of ICTs across the academic enterprise. Research is increasingly characterised by greater emphasis on interdisciplinarity, multidisciplinary, transdisciplinary practices; an increasing focus on problems rather than techniques; and more emphasis on collaborative work and communication [16.] [17](This in turn creates new information and dissemination needs, since there is an increased demand for access to a wider range of more diverse sources; for access mechanisms that cut across disciplines; and for access to, and management of, non-traditional, non-text objects.

The four projects to be evaluated in this paper are:

- The OpeningScholarship Project funded by the Shuttleworth Foundation and carried out in the Centre for Educational Technology (CET) [18] at the University of Cape Town is using a case study approach to explore the potential of ICTs and Web 2.0 to transform scholarly communication between scholars, lecturers and students and also between the university and community. The focus is at an institutional level; the lever for change is seen as the ICT systems that this institution has invested in and their use within the university.
- The Publishing and Alternative Licensing Africa (PALM Africa) project, funded by the IDRC. The project is working across the conventional publishing industry and open access content providers, seeking to better understand how flexible licences, including online automated licensing systems such as CC+ and Automatic Content Access Protocol (ACAP), can facilitate citizens' access to knowledge in the digital environment and how the adoption of new and innovative business models of publishing can help African countries improve the publishing of learning materials. The first investigations are being carried out in South Africa and Uganda.
- The Opening Access to Southern African Research Project, being carried out by the Link Centre for the Southern African Regional University Association (SARUA), funded by the IDRC, is studying the issues of access to knowledge constraints in southern African universities and the role of open approaches to research and science cooperation. The research project aims to inform the development of the basis for policy advocacy at the institutional, country and regional level with respect to academic publishing and knowledge sharing in the 'digital commons' context.

- The Shuttleworth Foundation and the OSI are supporting the production of the Publishing Matrix, an overview of the workings of the publishing industry – formal and informal – to allow researchers, activists and funders to better understand the context in which they are operating. The problem that this project addresses is that if projects are to achieve wider access to learning materials in Africa, they need to be backed by an understanding of how publication and knowledge dissemination works in the countries concerned, where there are blockages and weaknesses in the provision of learning materials and other knowledge resources, and where traditional systems are working well.

The projects described share methodologies of qualitative analysis, exploratory, descriptive and action research. They combine higher education policy studies with analysis of technology use and its impact. They share the perception that, as a result of the changes being brought about in research and teaching through ICT use, technical, organisational and communication infrastructure needs to be analysed in an integrated knowledge cycle. Most strikingly, in contrast to many open access initiatives, the projects combine to explore the potential for finding solutions that could also involve the publishing industry, formal and informal, in changed business practices that could deliver sustainable models for greater access to learning materials.

In analysing these projects we will consider open access in the context of university missions: academic teaching (knowledge building cycle), research (research, development and innovation cycle) and social engagement (promoting the utilisation of knowledge produced in universities for the benefit of communities/society). The potential value of commons-based, open access approaches for universities would be the creation of an environment which fosters a more rapid growth of the volume of research output than is currently occurring, and the more effective utilisation of research activity to expand the knowledge base in any particular field by building on what has gone before.

The conceptual framework shared by these projects acknowledges the context of African countries and their universities in the emerging information and knowledge economy, a world view that regards information and knowledge as central to the development and emergence of a new form of social organisation. This view endorses the role of universities as centres of knowledge production, with a primary mission to produce, communicate and disseminate knowledge. Using the case studies of the projects described above, this paper will describe the barriers in national and institutional policies that currently block the use of ICTs for enhanced access to knowledge and will report on the shifts that are taking place as a result of these interventions.

Each project is examined in some detail, exploring the project methodology and its findings before drawing conclusions about the collaboration between the projects.

5. OpeningScholarship: the picture of an institution

The Opening Scholarship project is being carried out in the Centre for Educational Technology (CET) at the University of Cape Town, with the aim of investigating the impact of the use of ICT in scholarly communications in one of South Africa's leading research universities. Acknowledging the impact of social networking and Web 2.0 on the hierarchies of knowledge production and the role that can be played by a range of formal and informal technologies, the question asked by the OpeningScholarship project is how the ICT systems that are in place could help deliver much greater intellectual capacity and how a university like UCT could make the most effective use of its research knowledge; how it could avoid becoming a dependency, relying on its own intellectual output rather than on imported content. It also acknowledges the disruptive potential of ICT use: the ways in which changing communications could break down disciplinary silos in an increasingly inter-disciplinary research environment, breaching the walls of the traditional

curriculum.

The choice of university for this study was influenced by the fact that UCT, South Africa's leading research university, has made a serious investment in its ICT infrastructure, designed to allow the university to develop and leverage the knowledge that it produces in innovative ways. UCT is also unusual in having invested in the development of an institutional infrastructure in the Centre for Educational Technology that combines technical, research and pedagogical skills in an academic department. The explicit aims of the department are to enrich and enhance the curriculum; provide for the needs of a diverse student body; and support staff in transforming, improving and extending their practice. CET is a partner in the international Sakai collaborative project for the development of an open source learning management system (LMS) - in fact it was the first non-USA member of the community. The development of the UCT version of Sakai, Vula, has provided an interesting perspective on the relationship between open source and open access in delivering the increased capacity being sought through this project as well as providing a potential platform for opening resources.

The project has not taken a narrow view of what constitutes scholarly communications. It has taken seriously the university's statement of its own mission and national higher education policy in tracking scholarly communications in three directions:

- Academic scholarship: academic to academic;
- Teaching and learning: academic to student; student to academic, student to student;
- Community engagement: university to community (and community to university).

Although some work has been done at UCT and other South African universities to reveal how ICTs could support academic scholarship, teaching and learning, not enough has been done in terms of understanding how ICTs could be usefully employed in supporting community engagement and more particularly, how ICTs could undergird a coordinated approach to academic scholarship, teaching, learning and community engagement. On the national level, the question would be how to use ICTs to grow access to South African (and African) knowledge to deliver the aspirations of national policy, as set out in the White Paper on Science and Technology (1996) and of the key objectives identified in the university's own strategy.

This is an important reflection of the South African government's view of the role of the university in a knowledge society, particularly in an African country, in which research investment, the government suggests, needs to be recovered by way of impact on national development goals, for social upliftment, employment, health and economic growth. The use of ICTs is seen as an important component of this process, essential tools if South African universities are to take their place in the global knowledge economy. As the South African White Paper on Science and Technology (1996) spelled it out:

The world is in the throes of a revolution that will change forever the way we live, work, play, organise our societies and ultimately define ourselves... Although the nature of this information revolution is still being determined... [t]he ability to maximise the use of information is now considered to be the single most important factor in deciding the competitiveness of countries as well as their ability to empower their citizens through enhanced access to information.
[19]

What this project has aimed to do, therefore, is to pull together the various initiatives that are taking place and identify how maximum use could be made of ICTs at UCT to advance research, teaching and learning and community engagement through a coordinated set of coherent policies, action plans and technological and infrastructural systems.

5.1 Methodology

The principle methodology of this project has been the use of case studies to map a variety of uses of ICTs for scholarly communication at the University of Cape Town. The project has drawn upon desk research, semi-structured interviews, focus groups, and questionnaires in the conducting of these case studies. The project is contextualised in a review of international best practice and national policy and practice in order to frame and provide a context for the case studies being conducted.

The approach of this project has therefore been to take the university as a case study within the national context, explore ways in which the institution is reflecting national policy and matching this against international best practice. Finally, within the university, case studies have explored how individual academics and departments have been using ICTs in transformative ways for research communication, teaching and learning, and social impact and what lessons for university policy and strategy can be learned from this .

5.2 Findings

The project is in its final stages, due for completion in July. Its findings, although not finally analysed and integrated, are therefore fairly complete.

Although UCT's mission incorporates teaching and learning, research and social responsiveness as if they are equally rated, in reality the system is heavily weighted towards research, and research of a particular kind. The impact of national policy in this regard was evident in all the case studies dealing with research publication. Not unexpectedly, the project revealed the extent to which institutional behaviour is distorted in South Africa by the financial rewards paid to the universities by the Department of Education for publication in accredited journals, books and refereed conference proceedings. The rush for a substantial revenue stream, reinforced by the appeal the policy makes to an entrenched conservatism, particularly in the upper ranks of the university hierarchy, leads the university to place a very strong emphasis on targets for the production of journal articles in particular 'accredited' journals. This is further strengthened by a system of competitive rankings for individual scholars run by the National Science Foundation based on the metrics of citation counts. Both of these mechanisms place a neo-colonial emphasis on the primacy of international rather than local performance and on the metrics of citation counts as opposed to any attempt at evaluation of the contribution that scholarship is making to the the nation or region.

The predictable results are that the production of local scholarly publication is under-supported, with an equally predictable backward drag on the professionalism and quality of a number of journals in an environment where journal publishing in the traditional model is unlikely to be self-sustaining [20]. Moreover, the activities of academics involved in publishing and editing are not tracked centrally in the university system, although they may be reflected in a fragmented way in departmental records. South Africa shares a common presumption in the English-speaking world that the delivery of scholarly publication to be regarded as something that it is not the university's business to fund. While the university seems willing to invest very large sums of money in patent registration, presumably against the (largely unrealistic) expectation of revenue, the much smaller sums needed for publication do not feature in their budgets. This means that there is no source of financial support for the development of digital open access publications, nor for the payment of author fees for publication in international open access journals.

Although there are open access journals being published at UCT, such as *Feminist Africa* in the African Gender Institute [21] and expressions of interest by existing and potential new journals, there has been little actual take-up of open access scholarly publishing at UCT. In part as a result of the OpeningScholarship project and in part because of a national project for the promotion of open access scholarly publishing funded by the DST and being delivered by the Academy of Science of South Africa (ASSAf) [14] there

is increasing awareness of the potential of electronic publishing and open access to increase research impact. However, given the lack of institutional support systems – financial and informational – or any centralised institutional policy framework for open access publishing, this interest remains fragmented. On the horizon, however, is the prospect of the creation of a national journal platform as part of the ASSAf programme for the development of local open access journals.

As a result of the OpeningScholarship project, the UCT research department has became aware of the fact that in its systems, it was only tracking authorship of publications, and not the publications that are being produced on campus, nor the activities of UCT academics who are journal editors. There is therefore support for authorship and neglect of publishing efforts, even though this neglect is potentially detrimental to levels of authorship, as under-supported journals struggle to produce issues on time. An interesting spin-off from the project was the recognition that the profile of information in the university's central systems can wield considerable power. This became clear in a workshop on UCT's research information system at which Australian and South Africa universities compared their use of the publication record module of their shared system. A report from the University of Sydney provided a vivid example of how the creation of a record system, linked to a digital repository that records all publications – formal and informal – has served as a tool both to expand dissemination of university research and to profile and promote the university.

Another issue that has emerged at institutional level is the fact that the university has a centralised facility for the use of ICT for teaching and learning through CET, but there is no university-wide integrated system to support not only teaching and learning but also research data and publications across the institution. Given that the DST is planning to implement policy on access to data from public funding in 2008-9, this will become an increasingly important issue. Also, if UCT is to retain its status as a leading research institution, given developments in higher education elsewhere, it will have to begin to address, cyberinfrastructure needs for the 21st century, in collaboration with the South African higher education sector as a whole.

Where technology use is having increasing impact is in teaching and learning and this is because of UCT's investment in CET as a dedicated department for research and development in ICT use for education. It became clear in 2007 when the Vula LMS – UCT's version of Sakai – was launched that the use of an open source system that was user-friendly and capable of adaptation to user needs has substantially increased the use of ICT for teaching and learning on campus. The courses delivered through the online LMS grew from 191 in 2006, to 908 in 2007, the year that Vula was launched. To date in 2008, less than half way through the year, 933 courses are being delivered through Vula.

The figures show very clearly that there is a strong response to the use of ICTs for teaching and learning, with a particularly steep rise in 2007, when the Vula system replaced the custom system that had hosted courses prior to the creation of CET as a university-wide service. Anecdotal evidence suggests that this is at least in part the result of the ease with which lecturers can create their own course profiles and upload their course materials, given that this is an open source system, as well as student pressure for what they find a congenial and supportive environment.

The case studies of teaching and learning practice within Vula have revealed that the development of innovative teaching tools and learning environments is largely the result of individual motivation. Although there are ostensibly weightings for teaching practice in the promotion system and the university offers prizes for good teaching, the perception of lecturers is that the primary route to promotion is through the publication of journal articles, preferably in international journals.

An important driver of innovation, the case studies show, has been the support by the Mellon Foundation for Teaching with Technology grants [22]. These relatively small grants have been the source of a number of innovative programmes in Vula, using multi-media, animated simulations for technology teaching and

conceptual understanding; mobile technology for course administration and interaction; and simulation exercises building on social networking. What this makes clear is that relatively small levels of funding support can bring disproportionate results. While the university has shown vision in funding CET from mainstream funding, unlike most other universities, still does not fully fund the department and there are still many posts in the department supported by grant funding.

The case studies have revealed that the development of online courses is very much bound into individual departments and even into individual courses within departments. in an institutional culture which is still built around disciplinary ‘silos’ The university does not seem to have much centrally coordinated space for collaboration in teaching and learning. The OpeningScholarship project has, however, revealed the potential for significant interdisciplinary collaboration once the connections have been made. For example, the project found that there was more than one department involved in the use of V-Python open source software for the creation of animated simulations to enhance theoretical understanding and develop algorithmic thinking in science and technology. This is of vital importance in a country that still faces an educational deficit in scientific education. The opening up and expansion of these resources could therefore be of national value. The problem, however, in delivering a vision such as this would be the question of resourcing in an already-stretched university system.

The courses that use these innovations also demonstrate changes in the power relations between students and lecturers, with students playing a more active role in knowledge production. Another set of courses using online simulations of a different kind demonstrates a similar change in lecturer -student dynamics through the creation of online communities and role-playing. The Department of Public Law’s international law course, Inkundla yeHlabathu/World Forum, for example, has created an innovative tutorial simulation, in which students learn to apply the rules and methods of international law through a series of African case studies from the 1960s to the present day by simulating the work of legal advisers to ten African States. The course is delivered through a combination of formal, doctrinal lectures, small-group tutorials and the Inkundla yeHlabathi simulation. A compilation of cases and materials, the e-casebook, is made available to students both online and on CD-ROM for offline use. This course has been recognised in the Sakai community, through the Teaching with Sakai Innovation Award , sponsored by IBM, as one of the two most innovative courses in the Sakai community worldwide in its use of technology for transformative teaching.

When it comes to opening access to these resources beyond the university,, the vision of Salim Nakjhavani, the course convenor, is to gradually engage other African universities in parts of the simulation, deployed through Sakai and hosted by the University. The University of the Witwatersrand (Johannesburg, South Africa) plans to join one component of the simulation in late 2008. This course provides an exemplar of the unfolding nature of open education and highlights some of the challenges that need to be addressed in order to make this simulation open to all. These challenges include copyright clearance and long-term sustainability models. While many of the cases that the students use, from the International Criminal Court in particular, are in the public domain, many commentaries on these and other cases that they need to refer to are not.

In courses such as these, students form active communities and, according to their lecturers, can develop passionate alliances related to their roles in the simulations. There is also the potential for increased contributions to the creation of online learning materials by students.

A further and unexpected sign of student willingness to create their own space in the system is the fact that a growing number of student societies are using the Vula space to manage their communities and their projects. Students are active in community responsiveness projects at UCT and the latest social responsiveness report at UCT reports two of these [23]. While there is still no comprehensive tracking of public benefit programmes at UCT, the university has become aware of the need to demonstrate its

contribution to national development and so has started an initiative to track and report on the various projects on campus, student and staff-driven. At a recent social responsiveness workshop it became clear that not only are there a large number of programmes at UCT that make a considerable contribution, but also that among these are projects that produce a variety of publications: research reports, policy guidelines, training manuals, community information resources, and popularisations. These are produced without financial or logistical support and the projects concerned complained that their work was not recognised as academic output and did not receive recognition or incentives, in spite of its importance to the community and the university's reputation. The importance to the university is recognised at senior level. As Deputy Vice-Chancellor Martin Hall expressed it, in a climate in which government is questioning whether it gets value from its investment in higher education research:

[U]niversities [need to] assert the importance of their independence, and the value of the knowledge commons as a seedbed of innovation ranging from product development to the design of effective public policies. They also recognize that, for the knowledge commons to acquire public credibility and support, they need to show how their work is responsive to the pressing objectives of development. In pursuit of this, they develop a range of smart interfaces with both the state and private sectors, promoting effective knowledge transfer, and showing, through example, how there can be a valid social and economic return on public investment in their resources. [24]

A number of projects mentioned that they used Vula to support their projects and it is clear that both a central record of these projects, support for publications through the provision of publishing platforms and the creation of an institutional repository of research outputs would be welcomed. The question the university needs to confront is how much the effective dissemination and publication would add to the impact of its social responsiveness programmes, how much this would contribute to profiling the institution and to its ability to attract government and donor funding.

6. PALM Africa - from polarisation to collaboration

Publishing and Alternative Licensing in Africa (PALM Africa) funded by the IDRC and led by Dr Frances Pinter, Visiting Fellow in the Centre for the Study of Global Governance at the London School of Economics, addresses some of the sustainability issues raised by the OpenScholarship project and Opening Access to Knowledge in Southern African Universities. In an African context, in which access to internet connectivity is often limited and in which the question of distribution of learning materials is a serious challenge, what is missing, this project argues, is research on how open access approaches employing flexible licensing could work in conjunction with local publishing in developing countries to improve access to learning materials. Through the action research element of the project it is expected that a variety of new business models appropriate for Africa will be devised and tested. The focus of the project is intended to be primarily on the higher education sector, both because the levels of ICT infrastructure and connectivity in this sector are adequate to the task and also to align the project with the focus of other IDRC interventions in the region.

The overarching research question that this project addresses is: whether the adoption of more flexible licensing regimes could contribute to improved publishing of learning materials in Africa today. An important component of this project is the recognition of the contribution that can be made by professional publishing skills: the services of commissioning, editing, design, marketing, validating, branding and distributing learning materials. The project explores how more flexible licensing regimes might allow publishers to access a broader range of materials to which they might add local relevance, publish successfully and distribute in a manner that leads to more sustainable publishing and improved access for readers. In other words, what is being explored in this context is the potential for increased access to be generated through partnerships

between open access and commercial publishing models or through the use of innovative licensing and business models that address the particular difficulties of African markets.

The possible solutions to the various structural and process issues that are beginning to emerge from this study might range from alternative business models in market sectors in which the ‘free online’ open access models might be sustainable with public funding, to more complex models combining the commercial and the ‘free’ in various new ways. The scholarly literature has identified a number of viable ‘some rights reserved’ models with reference to a few examples primarily in the fields of music and software. This is the first comparative study of its kind that engages with stakeholders to build up appropriate business models from inside the industry and then proceeds to test the viability of those models. The countries that will be participating are South Africa and Uganda.

In the higher education sector, the problems that this project will address include the current difficulties faced in the development of and access to scholarly writing and textbooks produced on the African continent, given resourcing problems and small market size, as well as the barriers to inter-African trade. Then there are the barriers imposed by the high cost of imported textbooks when they are shipped or co-published using conventional publishing business models. Finally there is the need for localisation of international materials [3] [6] In all of these cases, there is potential for electronic publishing to transcend the distribution difficulties and added costs that arise in the physical movement of books across such great distances. The final product could then either be e-books where technology availability allows, or the use of local printing to produce affordable print copies in the local market. Chris Anderson’s ‘Long Tail’ market model would suggest that, given that these are marginal markets for international publishers, there should be opportunities for exploring new financial models – including the potential for open access and commercial models used in conjunction with one another – in order to find innovative ways of meeting market needs without the high prices that have accompanied the conventional book trade models.

6.1 Methodology

This project brings together active research in the form of publishing demonstration projects combined with an academic assessment that reviews whether or not liberalising of licenses may bring about improvements in the publishing process defined as increased access to materials while maintaining sustainability of publishing services. Hence the emphasis is on collaborative efforts to find practical solutions. The outreach activities aim to create a space for discussion of the outputs and outcomes of the projects so as to encourage a deeper understanding of the role of licensing and broader engagement with decisions on the types of licenses that fit the specific needs.

The methodologies being employed in the project include literature review; qualitative analysis through questionnaires delivered at a stakeholder seminar; and publishing workshop for capacity-building in each country. Following these interventions, publishing exercises will be supported in each country and a comparative analysis made of the results.

6.2 Findings

This project is still at an early stage, with publishing workshops due to be held in Uganda and South Africa in May and August 2008. However, some interesting insights are emerging already, some as a result of collaboration with other projects.

It has become clear that the formal publishing industry internationally is trying to come to terms with the digital age and is experimenting with a number of new business models. This new disruptive digital technology is necessitating new approaches to copyright. Yet, where we stand today is still at the incubation stage of

these new models, with caution competing with boldness as the industry tries to find ways of recovering its investments. In the meantime there is still the urgent need to see how these new models may facilitate access and distribution in developing countries. Discussion and debate about new licensing and business models are becoming more insistent in the global North, but are less evident in Africa. This is ironic, as it is in the difficult market conditions in Africa that the use of flexible business models, linked to digital content delivery could have real traction.

In South Africa, connections have been forged between the OpeningScholarship project and PALM Africa . Some of the larger academic textbook publishers are interested to explore the changing environment of teaching and learning at UCT and as a result, a workshop with one publisher and an interview session with another have already been organised which included representatives from the PALM and OpeningScholarship projects. It was clear from these discussions that the publishers were beginning to realise the need to grapple with a changing environment brought about by the use of online learning platforms. This is challenging them to explore changing business models. and there is now an interest in exploring how to interface with online and multimedia content being developed in the universities. There might also be potential for exploring licensing options for the inclusion of textbook and commentaries in online delivery in LMS such as Vula., for fully integrated course material incorporating published materials and university-generated content. It is in the OpeningScholarship project that the first steps are being taken to investigate the copyright solutions that could allow such materials to be opened beyond the originating university.

The results of the PALM Africa project should help provide sustainability models for the delivery of scholarly and textbook materials in an African context and, it is hoped, help foster inter-African trade, using flexible licensing and print-on-demand to overcome the current barriers that inhibit it. There would also appear to be potential for exploring different licensing models to make available publications from the long tail of international publishers to lower the cost of specialist but vitally necessary publications into Africa.

7. The Publishing Matrix – mapping the publishing industry

The Publishing Matrix project, funded by the Open Society Institute and the Shuttleworth Foundation, arises from the acknowledgement that the access debate is now shifting from access alone to a consideration of the need for participation by developing countries in open knowledge production. If projects to achieve this goal are to succeed, they need to be backed by an understanding of how publication and knowledge dissemination work in the countries concerned, where there are blockages and weaknesses in the provision of learning materials and other knowledge resources, and where traditional systems are working well.

There also needs to be an understanding of how the supply chain works in the different publishing sectors, particularly where print products would be needed. An example has been a rush to provide free textbooks for schools in developing countries. Initial enthusiasm is now being tempered by the realisation that the inhibiting factors preventing the wide dissemination of school textbooks do not reside in content development alone, but in printing and distribution. Donors, activists and policy-makers are seeking a more complex understanding of how best to advance access in circumstances where print products need to be distributed in what are often complex supply networks.

While there is a common understanding in the open access movement of the goals that are being pursued, there are obstacles as the new world meets with the old. People of good will are struggling to find consensus on what aspects of traditional ways of learning and communicating should be preserved and how we might be better served by newer ways of generating and communicating knowledge. Vested interests abound, opportunists deflect and derail good intentions, but equally serious is a lack of understanding

of past, present and possible future contexts, and this is leading to fragmented decision-making. Policies are being made on the hoof with unintended consequences that can destroy many of the skills and capacities we actually wish to preserve. Equally, fear of the unknown is holding back the taking of justifiable risks. This study is intended to pull the various strands together, identify the friction nodes, and contribute to creating a more strategic vision of what changes to support.

Outsiders face some difficulty in understanding how publishing works, not least in grappling with the fact that price differentials between countries are not determined only by publishers' pricing practices, but by a complex set of circumstances in an industry in which price can be largely a factor of the size of the readership in a particular country. This study is therefore intended first and foremost to be a roadmap that aims to help others engaged in changing how knowledge, emanating out of both developed and developing countries, is communicated and how that may reduce the knowledge divide.

A component of this project will also be a contribution of a better understanding of what professional publishing skills are needed for the effective development and dissemination of knowledge products . For example the often-cited case study of the HSRC Press in South Africa, which offers a dual model digital open access and for-sale print publication depends upon a highly professional publishing and marketing team for its success.

The Publishing Matrix is being prepared as a wiki that will provide an account of how publishing works in different sectors along the value chain, providing multiple perspectives on how the industry works. The information produced will help inform the PAM Africa project and should provide a useful resource for the investigation of ways to improve access to knowledge in the southern African region.

7.1 Findings

Although it is too soon to have hard findings to hand, there are some realisations that are already offering new insights. Most striking was the realisation, when the matrix outline was drawn up and the different sectors profiled, of just how much publishing actually happens outside of the publishing industry. A number of NGOs have been practising what are effectively open access models for years, while corporate and government publishing also produces a wide range of content, including training and curriculum materials. This needs to be better factored in in mapping the access to knowledge terrain.

8. Opening Access to Knowledge in Southern African Universities

SARUA has, in collaboration with the International Development Research Centre (IDRC) and the Link Centre at the University of the Witwatersrand, launched a research study entitled *Opening Access to Knowledge in Southern African Universities* to study the issues of 'access to knowledge' constraints in Southern African universities and the role and potential contribution of Open Access frameworks and initiatives for research in the region. The project is a qualitative research study that will be implemented in seven countries in the Southern African region over a ten month period. The study will assess the current situation pertaining to access to knowledge constraints in Southern African Universities and the role of Open Access Frameworks and initiatives for research and scientific collaboration.

The research questions being asked are exploring:

- The existing constraints to availability of academic and other relevant research publications in the social sciences and humanities, the health sciences and the natural sciences and engineering.
- The extent to which Southern African universities are changing their practices relating to

production and dissemination of research and publications and if so, how.

- How Southern African universities can increase the availability of academic and other relevant research publications to students and researchers.
- What measures would be required to encourage new approaches to knowledge production and dissemination in Southern African universities among librarians, research managers and prominent researchers/scientists.
- How open access could benefit and contribute to scientific collaboration and endeavour, and what its implications would be for research across higher education institutions across the region, given the current limitations confronting Southern African Universities.
- How feasible would the establishment be of a SARUA regional open access network(s) based on an ‘open knowledge charter’, and the development of a Science Commons and what would the options be for doing so.

SARUA seeks to promote Open Access for increased quality research, enhanced collaboration, and the sharing and dissemination of knowledge. The outcomes of this project will inform the development of a longer-term SARUA programme aimed at promoting awareness and mobilising the University leadership across the region to promote free access to knowledge and enhance scientific research and collaboration. The importance of SARUA’s involvement in this project is that as a regional university association it has the potential for real traction in the formulation of policy in a wide region, involving some 64 universities in African countries south of the Sahara. The findings of this research project could therefore be of considerable importance in providing the base for the regeneration and growth of southern African universities.

The project acknowledges that developing countries, especially in Africa, face a broad spectrum of research infrastructure and capacity constraints that limits their capability to produce scientific output and absorb scientific and technical knowledge. Unequal access to information and knowledge by developing nations, exacerbated by unequal development and exchange in international trade, serve to reinforce the political and cultural hegemony of developed countries. The impact of knowledge-based development will continue to have insignificant impact for as long as this asymmetry in research output and access to up-to-date information remains [4].

At the same time, the project acknowledges the importance of the network society, in which, as Manuel Castells [25] describes this order, the generation of wealth, the exercise of power and the creation of cultural codes depend on technological capacity, with information technology as the core of this capacity. This project is delivered in the understanding that knowledge production, communication and dissemination are becoming central to the mission for all universities in the 21st century, thus enabling a shift beyond teaching towards research and civic engagement. It acknowledges the ways in which the internet and other collaborative technologies are changing the way universities conduct their business by making it possible to conduct collaborative research across disciplines, institutions and countries; making it possible for researchers and students to share working research and publications online; and to promote e-learning for undergraduate and post-graduate programmes.

This creates the opportunity for African universities to participate in global knowledge production activities with significant potential gains through, inter alia, increased resources for research and publication in local and international academic journals. For institutions operating in developing countries within resource constrained environments such as SARUA member institutions, these technologies and associated practices offer tremendous opportunities for improving the research, publishing and dissemination processes and putting Southern African knowledge at the service of local economies and societies. The critical question is whether we are positioning our institutions to take advantage of these opportunities.

This question can only be answered if we understand the present constraints to knowledge production, processing and dissemination within our universities and the extent to which collaborative technologies and its associated practices can contribute to increasing our capacity for generating knowledge and expanding existing knowledge. The rise of open approaches to scientific endeavours and research are closely associated with open source technologies, open access, open data. Open research for example, can significantly contribute to generating knowledge within our institutions.

8.1 Methodology

The study is employing a qualitative strategy of inquiry. A review of the literature and document analysis is being undertaken to assess what the emerging developments and trends are internationally and in Southern Africa. The literature review will serve to frame the inquiry and provide the basis for the formulation of the research questions and the key informant interview guidelines. A research methodology workshop has also been held to refine the design and methodology for the study in a participative way.

The research will be aimed at gathering data from two respondent groups. The first group will consist of the heads of research and research managers of the selected universities and the second group will comprise of key informants in the community of librarians, academic publishing houses and teaching/research/scientific communities based at the universities.

8.2 Findings

Although the research findings for this project are not yet available, the initial results of the survey will be reported at the ELPUB 2008 conference.

9. Conclusions

These four projects, although still in progress, taken together have already demonstrated that there are gains to be made in collaboration between projects offering different perspectives to common problems. The projects share a common understanding of the importance of the information and knowledge economy; and also of the inequalities inherent in the economics and politics of global knowledge production. Acknowledging the changing research environment, in which collaboration is of primary importance and the hierarchies of knowledge production are changing, these projects together chart at different levels and from different perspectives how these changes are impacting in Africa.

Mapping across the four projects, it becomes clear that before formulating policies and strategies at the national level, there needs to be an understanding of the institutional climate within the universities and the competing cultures within the institutions, as well as of the needs of the communities within which they are operating.

A number of issues have emerged from the combined wisdom of these projects that would need to contribute to any effort to bring African research into the cyber-age and ensure that it is effectively published:

- The dominant culture of research publishing needs to be interrogated, with its narrow focus on journal articles in particular and its uncritical adherence to a global model that in fact depends upon an inequitable, imperialist and commercially-driven value system. Rather, the full value of the research being produced in African universities needs to be released for the benefit of the continent.

- In order to achieve this, there would need to be a radical change in the current attitudes of university administration, government and senior academics, that support for publication and dissemination is not the job of a university. It is clear that in a digital world, the universities and allied NGOs are already at the forefront, exploring ways of harnessing the potential of the internet, something that publishers could learn from. This in turn needs government policy to recognise open and collaborative approaches to generating impact from research investment, rather than only the lock-down and proprietary models of patents and copyright protection currently valued.
- Learning from the example of CET at UCT, there clearly needs to be a better understanding of what ICT infrastructure needs to be in place not only for teaching and learning, but also for an integrated approach to research management and effective research dissemination and publication. This would in turn need to include grappling with the changing job profiles and reward systems for staff working in ICT, who need to combine technical, research, communications and pedagogical skills.
- In Africa, there is a need to interrogate the common wisdom of both the open access movement and commercial publishing in the North models to come up with sustainability models that are workable in an African continent.. There is also, given the marginalised position of African research, a need for the incorporation of professional publishing skills and effective and targeted publishing strategies, wherever these are sited, for research outputs to reach their intended markets. ‘
- The PALM Africa project and the Publishing Matrix provide a salutary reminder that in the African context, where resources are scarce, the use of new business models and commercial partnerships might well be needed to provide sustainability, particularly in a context where print is often still needed. Flexible licensing can also address the needs of a changing environment in the NGO sector, in which blended approaches are needed that combine sustainability and public interest.

Taken together, these projects should help to provide a comprehensive vision of what (complex) steps would be needed to create a publishing environment that could harness the potential of ICTs and open access approaches to give a voice to African knowledge. The SARUA project for Opening Access to Southern African Knowledge should hold the key to advancing this vision to the region as a whole, with the capacity to drive an initiative at the upper levels of the university administrations in the region.

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