Supply-Demand Gaps in Meeting Research Needs in a Networked Environment: Challenges and Opportunities for Academic Libraries

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Introduction

World class universities are characterised by:

- ❑ **World reputation** (**3ʳᵈ** party endorsement, world ranking**)**
- ▪ **Research performance** (**research output**)
- ▪ **Prominent graduates** (celebrities of national culture community leaders and international figures)
- ▪ **International participation and visibility** (publications , exchange visits, international teachers, international students, editorship of international journals, leadership in international networks)

Presentation Agenda

Aim: Assesses research supply-demand gaps in universities in sub Saharan Africa and the role of academic libraries. The presentation uses examples from global ranking of universities, institutional repositories, PhD outputs, patent filing with WIPO, etc . Suggestions to improve the situation Are proffered

Focus: sub Saharan Africa excluding North Africa and to a lesser extent South Africa

- ❑ Tradition of North African universities largely influenced by academic environment in Europe and the Middle East
- ❑ South Africa -unique past political dispensation

Global Ranking of Universities

Assumption:

- ❑ **Web has become one of the main sources to obtain information on academic and scientific activities**
- ❑ **Ranking reflects the commitment to the dissemination of scientific knowledge**

Research Snapshot in African Universities

Recent global ranking of universities: African universities hardly among the top 500. League table is dominated by Universities from (Europe and US dominate)

2008 rankings (Top 500) globally:

- **UCT - 252nd position**
- **Wits - 398th position**
- **University of Cairo – Fallen off list (from 2007)**
- **UKZN - 477th position**
- **UP - Fallen off list (from 2007)**
- **SU - Fallen off list at 654th (or 566th) position**

(Institute of Higher Education, 2008, China)

Models for Global Ranking Universities

Time Higher Education Supplement (2008):

- ❑ **Peer review   40%**
- ❑ **Employer review   10%**
- ❑ **Student/teacher ratio   20%**
- ❑ **Citation index   20%**
- ❑ **International teachers   5%**
- ❑ **International students   5%**

Models for Global Ranking Universities

Webometrics Ranking of World Universities (2008):

- ❑ **Web size   20%**
- ❑ **Rich files   15%**
- ❑ **Scholar (Google) 15%**
- ❑ **Visibility (Link) 50%**

Models for Global Ranking Universities

Shanghai Jiaotong Academic Ranking of World Universities, China (2008):

- ❑ **Alumni as Nobel Laureate   10%**
- ❑ **Faculty as Nobel Laureate   20%**
- ❑ **Highly-cited researchers   20%**
- ❑ **Articles in Nature and Science 20%**
- ❑ **Articles in SCI   20%**
- ❑ **Size   10%**

Summary Criteria for Global Ranking of Universities

- ❑ **Research productivity (number of articles published in peer reviewed journals)**
- ❑ **Research impact (number of citations of a given article in a specified period of time)**
- ❑ **Research excellence (the number of highly cited papers in ESI-Essential Science Indicators**
- ❑ **Number of articles in higher impact journals**

(Institute of Higher Education, 2008, China)

Summary Criteria for Global Ranking of Universities

- ❑ **Visibility of the institutions on the Web**
- ❑ **Use of ICTs**
- ❑ **Volume of published material on the web**
- ❑ **Institutional statistics**
- ❑ **Size of the institutions (students, faculty, etc).**

Sources of data for ranking include: websites, surveys of students, scholars or employers (Institute of Higher Education, 2008, China)

Controversy over Ranking Criteria

Debate and controversy rages among universities performing poorly over criteria. Those critical of the ranking argue that:

- ❑ Methodologies used are flawed as universities are not physically visited
- ❑ Not all information is on websites
- ❑ Information used is outdated
- ❑ Linking employment rates to relevance of courses is flawed
- ❑ Universities face different challenges and different criteria should be used
- ❑ Number of students differs so does number of faculty

Use of Global Ranking of Universities

Global ranking of universities:

- **Gives an indication of quality of graduates and research**
- **Determines proportion of funding to universities (e.g. UK)**
- **Useful as a screening device for employers**
- **Prompts researchers to increase their publication output in visible journals**
- **Increases awareness among academics on how best to make their research activities public**

Implications of Ranking for Poor Performing Universities

Poor performing universities in global ranking, may suffer from:

- ❑ Lowered esteem in the eyes of stakeholders such as potential students and funding agencies
- ❑ Negative effect on academic exchange with reputable universities from other parts of the world
- ❑ Reduced funding from purse string holders
- ❑ Low competitiveness for faculty and students in the global labour market
- ❑ Less attractiveness as a preferred destination for students

Factors (Internal) Affecting Negatively Performance of African Universities in Global Rankings

- ❑ Limited or poor web presence as most research offline
- ❑ Publishing in low impact journals
- ❑ Poor record keeping systems-lack of statistics
- ❑ Limited postgraduate programmes
- ❑ Low completion rates in postgraduate programmes
- ❑ Poorly equipped libraries/laboratories
- ❑ Limited capacity to supervise research
- ❑ Limited investment in research
- ❑ Poor quality of PhDs

Factors (Internal) Affecting Negatively Performance of African Universities in Global Rankings

Paucity of institutional repositories:

Onyancha (2008) in recent study found that:

- **Africa only represents 1% (13) of global repositories**
- **Europe 48% (521)**
- **North America 31% (328)**
- **Asia 10% (106)**
- **Australasia 6% (66)**
- **South America 4% (41)**
- **Caribbean 0% (1)**
- **Central America 0% (1).**

Factors (Internal) Affecting Negatively Performance of African Universities in Global Rankings

Low PhD Output in African Universities 1990s-2001:

- ❑ **University of Ghana Legon, 15 PhDs-1998-2001, all disciplines**
- ❑ **Makerere University, 43 PhDs-1990-1998 in all the sciences**
- ❑ **University of Dar es Salaam, 56 PhDs, all fields,1990-1999**
- ❑ **University of Zimbabwe, 32 PhD, agriculture, arts and social in**
- ❑ **2001**
- ❑ **UCT, 382 PhDs 1996-2000 all disciplines**
- ❑ **University of Pretoria, 1100 PhDs, 1991-2000.**

  (Source: Szanton and Manyika, 2001)

Factors (Internal) Affecting Negatively Performance of African Universities in Global Rankings

Paucity of Researchers in Africa:

Pascal Database (Mutume, 2007) shows:

- ❑ 1,000 full time researchers, producing an average of 500 scientific papers annually

- ❑ This translates to 35 researchers per one million inhabitants and about 17 scientific papers per one million people based on scientific publication scores.

- ❑ Sub Saharan Africa has about one scientist or engineer per 10,000 people, compared with 20–50 in industrial nations

Factors (Internal) Affecting Negatively Performance of African Universities in Global Rankings

(Botha and Simelane, 2008; Ballantyne, 2002; etc):

- Local content largely offline
- Poor documentation of local content such as IK
- Research not published
- Libraries maintenance of lists of theses and dissertations is poor
- Limited involvement of libraries in KM
- Poor writing skills among students
- Lack of research expertise
- Libraries have yet to transform into 'learning organisations'

Factors (External) Affecting Negatively Performance of African Universities in Global Rankings

1980s Global Crises:

- **Rapid expansion of higher education (13 universities in 1960, 300 universities in 2002) without corresponding increase in funding**

- **Student numbers rose from 350,000 in 1975 to 1.7m in 1995 in African universities (World Bank, 2000).**

- **World Bank policies of 1980s (SAPs)**

- **Severe cuts in government spending – WB expenditure on education world wide decreased from 17% in 1985-89 to 7% in 1995-99 (World Bank, 2000)**

Factors (External) Affecting Negatively Performance of African Universities in Global Rankings

1980s Global Crises:

- **Kenya: education budget reduced from 38% in 1987/88 to 19% in 1988/89 (Maina, 1989:110)**

- **Kenya: expenditure per student decreased from US$6,300 in 1980 to US$ 1,200 in 1995 (Republic of Kenya, 1993)**

- **Falling commodity prices**

- **sharp rise in crude oil**

- **Trade barriers**

- **Declining GDPs**

- **Political instability**

- **Debt crisis**

Consequences of 1980s Crises on African Universities

- **Libraries stopped purchasing books and journals**
- **Research funding dried up**
- **Faculties could not maintain membership in professional associations or attend international conferences**
- **Physical facilities (classrooms, hostels, labs, libraries, etc.) crumbled**
- **Building of new structures was terminated**
- **Scholarships for faculties either declined or stopped**
- **Hiring of new staff stopped while brain drain increased**

Consequences of 1980s Crises
on African Universities

Brain Drain:

Figures vary, but currently it is estimated that there are more than 300,000 (out of which more than 40,000 are PhD holders in Europe and US alone) highly skilled and experienced professionals from Africa living and working in Europe and North America comprising of doctors, lecturers, researchers, nurses and professional managers (UNESCO Conference 14 February 2006).

Consequences of 1980s Crises on African Universities

In 2006, 145,300 patent were filed with The World Intellectual Property Organization (WIPO) Patent Cooperation Treaty (PCT) from 136 countries (WIPO, 2007):

- USA - 49,555 (34.1%)
- Japan- 26,906 (18.5%)
- Germany -16,929 (11.7%)
- Republic of Korea -5,935 (4.1%)
- China - 3,910
- India – 627
- Singapore – 402
- South Africa (349) ahead of Brazil and Mexico

ICT – A Window of Opportunity to Revitalise Research in African Universities

- ❑ Digital scholarship
- ❑ Shift from print media to Internet and digital media.
- ❑ Emerging "iPod generation" type of student.
- ❑ Open access/digital repositories
- ❑ Digital information resources increasingly relied upon as primary or complementary information sources of scholarship.
- ❑ Scientific journals increasingly produced as e-versions.
- ❑ Web 2.0, Library 2.0, Patron 2.0.

ICT – A Window of Opportunity to Revitalise Research in African Universities

- **Provision of services and access to more literature 24/7**
- **Opportunities to offer outreach services**
- **Increased visibility of universities**
- **Inter-disciplinary research, collaboration & partnership**
- **Reduced duplication of research**
- **Increased research output**
- **Libraries able to buy directly from publishers**

Role of Librarians in Revitalising Research in African Universities

- **Researchers:** their actions should be based on informed research
- **Facilitators and intermediaries:** help people use resources, provide tools for researchers to organise their work, etc
- **Knowledge managers:** harness individual and team
- **Consultants:** help software engineers to develop friendly systems
- **Instructors and educators**: delivering information literacy & education on academic integrity
- **Content creators**: digitise grey literature, document IK, provide high quality metadata to service needs of researchers and net generation students who may no longer come to the library
- **Entrepreneurs**: adopt marketing strategies to deal with rising costs of content/generate funding through outreach services
- **Advisors:** advise government on new IP and licensing regimes

Challenges Librarians Must Overcome

- **Restrictive IP and licensing regimes**
- **High cost of digital content**
- **Lack of ICT facilities and limited bandwidth**
- **Recruitment and retention of critical skills**
- **Multidisciplinary nature of research**
- **Increasing roles of librarians**
- **Heterogeneity of digital materials**
- **Decision on what to digitise**
- **Sophistication of net generation**

Way Forward

- **Expansion of higher education**
- **Establishing elite institutions**
- **Globalizing the institutions**
- **Cross-border trades of education services**
- **Re-positioning the private sector**
- **Fostering the philanthropic culture**
- **Increase of PhD holders**
- **Concentration of talents**
- **Internationalization of institutions**
- (**WB, Jakarta, Feb 12, 2008**)

Way Forward

- **Librarians must think strategically** (No vision, no money; no plan, no money)
- **Partnerships and collaboration**
- **Invest in open access, institutional repositories & develop e-publishing policies**
- **Work with authors, publishers, to develop suitable business models to address issues of restrictive copyright regimes**
- **Encourage scholars to self archive pre-prints and post-prints of their papers in open access archives or institutional repositories**
- **Develop e-strategies and research portals**

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