

*Access to Research and Scholarship:
A View from South Africa's University of Johannesburg*

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Information and Communication Technologies (ICTs) have become vital to international competitiveness, making fast and effective communication possible between countries and across continents and underpinning the global economy. In addition, high value ICTs and services themselves form part of an expanding network of international trade and commerce. They are the backbone of scientific and technological innovation, and research and publication. Building a knowledge economy, establishing strong and innovative research communities and centers of excellence, disseminating new knowledge and participating in the global information and research enterprise all depend on ICTs. Educationally, they are being used to deliver a diverse array of learning experiences.

ICTs are critical to Africa's long-term growth. However, many southern African countries have gaps in ICT infrastructure and system deployment, which hampers the promotion of research and scholarship. Some of these limitations are:

- Teaching and research staff have reasonable access to computers; students much less so. On average, in the region there are 70 students per computer, falling far short of the target of five students per computer recommended for U.S. universities.
- Inadequate and expensive bandwidth is a major challenge. While this is a fast-changing area, the African Tertiary Institutions Connectivity Survey (ATICS) found that institutions' bandwidth was "too little, too expensive and not well managed." The average amount of bandwidth has gone up, but none of the universities surveyed had close to 100 Mbps connectivity.
- Costs of connectivity have fallen almost 50% compared to 2011, but, though precise international comparisons are difficult, the cost per Mbps may be as much as 20 times higher in Southern Africa than it is in the US or Europe.
- Enabling policies are necessary for effective utilisation of scarce resources. It is a concern that only half of the 66 the universities in the region report having an Acceptable Use Policy (AUP) in place, or have provided e-learning opportunities and training to their staff.
- Most significantly, there is little evidence of ICTs being used for advanced research. While most academics in the region utilize the Internet for research, this is generally restricted to browsing for online information or accessing online journals. Higher level research enquiry such as accessing distant scientific infrastructure, for example, supercomputers, modelling and simulation equipment, large astronomical telescopes or grid computing, continues to be limited.

The need to increase the quantity and quality of scientific research output in Southern African higher education has been well documented. As Kotecha (2008) notes, "the tipping point for African research and innovation will not merely be the ability to fully access and

use the new abundance of global knowledge and ideas, but to make an active and significant contribution to its creation” (p.21). Most universities in Southern Africa assess research output by relying on bibliometric analyses of papers published and cited in international indices, such as ISI. From an African perspective, the conduct of research is highly concentrated, with three countries, Egypt, Nigeria and South Africa, collectively accounting for over 80% of total output of scientific research papers. Comparing research output between universities in the Southern African Development Community region, South Africa with the best and most extensive infrastructure in the region, ranks highly, accounting for 75% of its output. There is also an imbalance within South Africa, with a small number of high performing universities contributing to a large proportion of the research output. It is clear that the region needs to move beyond being a consumer to being a producer of knowledge. Investment in research infrastructure, including ICTs, is critical to this.

The University of Johannesburg (UJ) has positioned itself as a leader in research that addresses the economic, social, political and technological aspirations of South Africa, in particular, and of Africa in general. It has invested in and mobilised vital human capital and advanced knowledge systems, and works closely with stakeholders such as those in industry and government.

A key aspect of UJ’s vision and mission is to establish an ICT strategy which:

- supports up-to-date, flexible and accessible teaching and learning;
- supports research that fulfills the demands of “supercomputing” required for advanced scientific and technological research;
- enables effective management of information, communication and institutional business intelligence; and
- enhances the effective and efficient operation of administrative and support systems and of institutional governance.

A specific example relating to the promotion of research and scholarship is the establishment at UJ in 2012 of a new Centre for Academic Technologies (CAT), which aims to use contemporary learning theories to support deep learning and research. CAT utilises a number of software applications to support the development of academic writing, and allows researchers to download initial research software to gain access to software licence management systems. It is currently negotiating with Elsevier and Gradnet to deploy an electronic delivery platform for e-books. In the last seven years, UJ is estimated to have invested about US\$6 million in the use of technology to enhance learning, research and scholarship. As part of its mission to achieve global stature, it has used international indices such as Incites, Scopus and Scival to assess its role in the global research arena, has applied for QS ranking, is a member of Universitas 21 and has entered into a number of research agreements with international partners. Notably, these include working with prestigious international laboratories such as CERN, the European Synchrotron Radiation Facility, the Australian Nuclear Science and Technology Organisation, the ELETTRA Synchrotron Facility (Italy), Institut Laue-Langevin, Grenoble (France), the ISIS Facility, and Rutherford Appleton Laboratory (UK).

In a developing country such as South Africa, and even more in the southern African region as a whole, access to technology is varied and uneven. In these contexts, considerable resources need to be invested to ensure optimal use of ICTs to promote research and scholarship of national relevance and global stature. The University of Johannesburg has moved decisively in this direction.

Finally, Morgan (2013), notes that while technology is a central feature of university life, its role is contested. Education, expertise, reading and thinking, and scholarship all

matter, and what technology has provided is an infrastructure. Ultimately, it is social systems that give context and meaning, and universities have an important role in driving this discourse.

References

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