Positioning the technological university library in higher education and human resources development in Africa

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Abstract

Purpose – This paper seeks to discuss the positioning of academic libraries in universities of science and technology in Africa. With the importance that is given to the establishment and outputs of these types of universities and to skills development as a contributing factor to Africa’s development, the role of library and information services are to be discussed. The paper aims to focus on the position of the library in relation to the changing complexity of information resources, tools for users to access information, IT developments, knowledge creation and dissemination, community engagement, support for innovation and entrepreneurial development, external partnerships and measuring service delivery through research.

Design/methodology/approach – The challenges for the library in science and technology universities are to remain relevant to the development of skilled human resource that can contribute to Africa’s economic and social development. The changing information provision landscape, the new community engagement programmes, the thrust to contribute to knowledge development and the support for innovation and entrepreneurial development ensure that the library remains relevant in the academic projects in Africa.

Findings – The library in science and technology universities in Africa and in other developing countries remains an important strategic partner in the development of human resources and overall economic and social development of the continent.

Originality/value – The discussion in the paper provides some insights into the planning and development of emerging technological university libraries in Africa and other developing regions.

Keywords Academic libraries, Africa, Higher education, Human resource development

Paper type Viewpoint

Introduction

Universities of science and technology are increasing in numbers on the African continent and it is the desire of every such new university to play a role in contributing to human resource development and the economic development of the country. Technical higher education and skills development in Africa must make a meaningful contribution towards solving the continent’s main problems of hunger, poverty, disease, corruption and job creation. Science and technology skills and many other skills in Africa are in short supply and it has always been argued that the more science and technology graduates the continent can produce the more it can prepare the ground work for better and sustainable economic development. The migration of some of Africa’s best skills to developed countries has worsened the skills gap on the continent and thereby denying it the capacity to industrialize and create more jobs.
Du Pre (2009, p. 5) states that “... institutions such as universities of technology, which specialise in making knowledge useful, will alongside other universities, constitute a dynamic and appropriate higher education system”. Furthermore, he notes that “the difference in focus and ethos between universities of technology and traditional universities will not only bring much wider variety and diversity into the higher education scene but also contribute meaningfully to greater innovation, technology transfer and international competitiveness” (Du Pre, 2009, p. 5).

The bulk of Africa’s raw materials are exported in raw form due to the lack of capacity and skills to add value and bring more revenue into the continent’s coffers. Unemployment levels are high in all countries due to the lack of capacity to absorb school and higher education graduates. An expanded skills base in science and technology could lead to the emergence of more value addition industries for Africa’s raw materials and the creation of a base for industrialization, the knowledge economy and thereby increasing the employment base for tertiary education graduates. The United Nations (UN) Secretary General recently called for the processing of raw materials as the solution to African economies in the wake of the global financial crisis (Asiamah, 2008).

Universities of science and technology, technical colleges, vocational skills centers, teacher-training colleges all play an important role in the production of human resources in Africa. Although university education is open to a few privileged Africans, the demand has been growing. In many parts of Africa parallel university programmes are offered to those in full time employment to study at night. Distance education programmes are expanding to cater for the demand in higher education. The establishment of the African Virtual University based in Nairobi Kenya has shown that Africa has the capacity to expand higher education to disadvantaged communities. The earliest universities and university libraries on the African continent were established by the then colonial masters as extensions or departments of universities in Europe and the UK (Made, 1984). In post independence Africa, we are beginning to see a new breed of an African university established through government or private foundations initiatives to cater for the growing demand of higher education and the expansion of the skills base.

At the heart of science and technology education and all other university and tertiary educational and training programmes are university library services, which play an important role of ensuring that the research, teaching and learning activities are adequately supported with information resources. It is given that the contribution of an academic library is central to the success of the mission and goals of all higher education programmes. While Africa has been largely a continent without books and other information resources, technological changes and the exponential growth of information globally are forcing the academic and research libraries on the continent to benchmark themselves with those in the west and the emerging countries of south East Asia, China, India and Latin America. Ajidahun (2006, p. 155) asserts “that a (technical) library that is inadequately funded and ill-equipped will produce disoriented, unskillful mediocre technical manpower”.

The academic library in Africa is not going to transform overnight into a vibrant information resource as its counterpart in the West, but it must be agreed that the global changes in the information arena are certainly having a profound influence on these institutions. The African university library must therefore remain relevant to
supporting the academic projects with scholarly information i.e. position itself in order to respond to the changing higher education and human resource development landscape that requires workers with mastery in information searching and use skills.

The role of the university library in higher education and human resource development in Africa is not well documented. It is important that its role is continuously researched, evaluated and documented and services designed to respond to Africa's unique higher education and human resources needs. This paper discusses the future position of the technological university library as an academic partner that plays an important role in higher education and human resources development in Africa and other developing environments globally.

The technological university and Africa's human resource needs
The United Nations Educational Scientific and Cultural Organization (Unesco) is encouraging African countries to expand science and technology education in order to expand their science and technical skills base. Unesco's efforts reflects the growing realization that science, technology and innovation are central to economic prosperity and to reaching the international development goals in such areas as food security, disease control, access to clean water and environmental sustainability (Unesco, 2009).

The emergence of science and technology universities in Africa does not necessarily mean that the traditional African universities have not been producing science and technology graduates, but rather the emphasis has been on establishing unique institutions that are wholly focused on these crucial disciplines. The approach in many different countries has been to transform existing technical colleges and polytechnics into new universities of technology that award undergraduate and postgraduate degrees but without necessarily abolishing existing diploma and certificate programmes. Universities of technology in Africa are seen as shifting in focus towards learner-centred rather than faculty centred institutions that provide greater learning opportunities, work integrated learning, the continuous upgrading of knowledge and skills and engaging in social development activities (Du Pre, 2009). The argument however goes further that the new science and technology universities should not just focus on science and technology but must broaden their offerings to arts, humanities and the social sciences. This broad based approach provides the new technological universities with a wide range of disciplines for science and technology students to cross pollinate with students in other non science and technology areas and in fact this is what is already happening in most of the so called science and technology universities globally.

Countries have been taking different approaches in the development of science and technology education. In South Africa for example since the reform of higher education started soon after independence, five universities of technology have emerged from mergers of what were previously technical colleges (or technikons as they are known in South Africa). In Zimbabwe similar developments took place when teacher and technical colleges and polytechnics were converted to universities of science and technology. In other cases, in Botswana a new science and technology university is being established from scratch. In Namibia there are plans to turn the existing polytechnic into a university of science and technology. In West Africa science and technology universities are much older and are spread in countries like Nigeria and Ghana. In East Africa there are several science and technology universities in Kenya,
Tanzania and Uganda. More recently there have been several private universities and
technical institutes established in these three countries to cater for the growing demand
of higher education.

Similar developments were witnessed in Europe in countries like Germany (where
such institutions have existed for a much longer period), Finland (where technical
colleges have been transformed into Applied Universities of Science and Technology),
the UK (where polytechnics were converted into universities) and Sweden. Today the
economies of these European countries are some of the leading world exporters of
manufactured goods and technology into the world economy. In Germany for example
its sustained competitiveness in the global economy is dependent on a number of
factors including the application of new technologies and the development of skills
levels across the full spectrum of the labour force (Jones-Evans, 2008). The strength of
the Germany’s SMEs, the leading contributor to its export competitiveness can be
attributed to the strong technical university education in that country (Venohr and
Meyer, 2007).

Finland is today a leading exporter of telecommunication technologies and an
information economy in the world. Behind this feature there is a specific Finnish model
of technological innovation, economic productivity, and social organization (Hiamanen
and Castells, 2004). Through the Finnish Science Park Association and a network of
 technological universities the country is involved in supporting developing countries
with expertise in setting university-industry partnerships. The technological
university libraries in African universities involved in these partnerships must also
learn how academic and research libraries in Finland have been part of the
development of science parks.

The university library’s role in higher education
In any type of university, the importance of the library is central to supporting its
teaching, learning and research programmes. In Africa academic libraries are of even
greater importance than to universities in developed countries. In all disciplines taught
at African universities both faculty and students depend almost wholly on the library
for the provision of scholarly information and in today’s networked environment in the
provision of the necessary access links to such information through the provision of
computer facilities and reading space.

The technological university library has a twofold function, of supporting, on the
one hand, the teaching of undergraduates and, on the other hand, the creative work in
scholarship and science by postgraduate students and members of the university staff.
The role of the university library is to ensure that the information needs of faculty and
students are adequately addressed through the provision of books, journals, and
reading space. This must be achieved through a more proactive role of engaging with
the strategic directions of both the parent institution and its faculties and departments
or it risks being ignored and marginalized from the core business of the institution
(Stubley, 2006).

Over the years the nature of information sources has been changing due to the
development of the internet. In Africa the development in ICTs have not been that
rapid and the continent remains challenged in accessing networked information.
Limited financial support to university libraries, poor IT infrastructure, skills
shortages have all contributed to the limited pace of development in most African
university libraries. A few academic libraries in well resourced institutions in countries like South Africa, Botswana, and Namibia are beginning to show that Africa has the capacity to build world class academic university and research libraries if resources are made adequately available and managed prudently.

The vision and mission of the technological university library
If the technological university library in African universities is to remain relevant in supporting the information needs of its mother institution it needs to articulate its vision and mission within the overall framework of the institutional mission and goals. Many universities in Africa are increasingly positioning themselves to address contribute to national development plans. In many countries the national goals provide universities and other higher educational institutions with frameworks for their visions and missions.

The library’s business strategy must be aligned with that of the university and all its internal and external activities. The core business of science and technology universities in Africa remains that of producing graduates that have relevant skills to improve the continent technological, scientific and industrial bases. In the same vain the academic library in the University of Technology is there to support this mission with relevant and up to date information services.

The vision and mission of the technological university library has to be communicated well and widely to the university’s constituencies like faculties, departments, students and staff. It is the responsibility of the library director and his or her library management team to ensure that faculty and departments accept and support the university library’s mission and goals. A better understanding of the university library’s goals in the university community will lead to a better response to its information delivery services. Through communication and the marketing of the university library’s mission and goals in various university committees extra funding and support can easily be mobilized to support library programmes and projects.

The roles of faculty librarians are to be continuously evaluated to enable them to interact more with faculty and departments in support of their teaching, learning and research activities. The technology library then positions its faculty librarians as its ambassadors who sell and advocate for library activities in faculties and departments. The library director’s role is then to strategically locate the library in the broader university and external environments by ensuring adequate financial and human resources support to run efficient services.

Information resources
Library sources, services, and operations have been influenced by the rapid technological innovations over the years. The way information is disseminated, captured, collected, stored and transferred has provided a new impetus in library functions and operations (Siddiqui, 2003). A number of technological universities in Africa are a result of the merger of various units spread over various campuses and this provides an opportunity for libraries to not only build diverse and rich collections but to also use technology to provide easy platforms to access information spread over a wide geographical area.

The growth in e-books, e-journals and other internet-based information services requires that the technological university library change its acquisition policies in
order to cater for new formats and changing information seeking behaviours of its users. The evolving collection plans in technological university libraries need to respond to the phenomenal growth in scientific information and ensure that subject librarians are kept up to date with these changes. As vendors scramble for a share of a very competitive market there is need for collection managers to be aware of contents of databases and how each one of them benefits their university community and make wise decisions in their final selection of which resources to invest in.

The open access movement provides an opportunity to the technological academic library to access a variety of world-class information resources that could never have been accessed easily in print environments. Many governments in the developed world are demanding that government sponsored research be made freely available through the Internet. The university library in Africa has the opportunity to take advantage of such information sources and make them readily available to their community of users. Furthermore the academic library in the technology university should position itself not only to be a technical information centre but also play a leading role in the creation of local scientific knowledge and information and dissemination (Chiware, 2007).

As many governments embark on e-governance projects designed to make information freely available to citizens through the Internet, the university library response is to provide access to such information. Government information by its very nature is important to the students and faculty in a science and technology university. More and more governments are involved in ground breaking research activities to support government work and the research results generated forms part of government publications collections in university libraries. Government information sources are also important sources for innovation, and entrepreneurial-development, as start-ups often require a range of legal information published by government departments. Government publications are a primary resource for addressing a broad range of diverse needs and they convey information, much of which might not be available elsewhere (Ren, 1999).

Access tools and instruction for users
The investment in improved access tools for the university library users will remain a preoccupation of library services providers in universities of technology. The tools will keep on changing more often than we like and even improve. As information intermediaries for disciplines that rely on current information, technological university libraries must always be selling to faculty and students tools that are designed to achieve the best results for their research, teaching and learning work. The library plays an increasingly important role in this age of knowledge based economies and with the prosperity that the Internet has brought, technical university library users are required to variously and rapidly search for information and retrieve various information and use knowledge sharing facilities (Yu, 2006).

In the same breath the library offers training to use these tools more efficiently and effectively to achieve a better return on the huge investments in these new search tools. The provision of information literacy in the technology university must be seen therefore as a partnership between the library and academic departments where the library provides guidance and leadership in formulating the overall university policy and guidelines on how to approach information literacy. The early days of information literacy provision in many universities witnessed libraries trying to take full
ownership of the programmes and implement them without faculty participation. This, however, is not practical from many perspectives, in that libraries staff are already overstretched in their duties to run effective information literacy programmes, without faculty participation, and endorsement in their curriculum programmes.

**Information technology infrastructure**

The greater part of academic library work is to such an extent computer based that even in the least resourced of libraries the building of a sound IT infrastructure has become paramount to the well being of the library and its programmes. Many African countries have been facing challenges of limited bandwidth to enable faster and more efficient downloading of networked information. While a number of international organizations have made investments to enable African university libraries to access both subscription, and open access databases, the limitations in IT infrastructure have hindered better utilization of these resources (Chiware, 2007).

A recent development by Seacom has been the completion of lying its 1.28 terabytes per second, 17,000 km submarine fibre-optic cable system linking Southern and East Africa to global networks via India and Europe. This marks a giant step in internet provision in some parts of Africa including higher education and academic libraries. The completed cable will enable African universities to have fast and affordable internet that handles large volumes of data, like their counterparts in developed countries. Universities in developed countries have had ten to 100 times as much bandwidth than African universities. The Seacom cable will bring about parity and will enable some African universities to participate in a meaningful way in research, development and education that was not possible before. It will also enhance Africa’s ability to attract and retain professionals who need proper broadband to work. This will be good news for researchers and students involved in data-intensive research like oceanography, radio astronomy, and physicists, who were longing to access nuclear research taking place at CERN in Europe. The cable will give them the type of bandwidth they need to access high-performance computing facilities (Van Wyk, 2009).

**Knowledge creation and dissemination**

The academic library in the University of Technology is well placed to play an important role in scholarly scientific information creation and dissemination. While the amount of scientific information generation from African scholars is very low, the African academics are known to shy away from publishing in local journals because of their lack of visibility and poor editing practices. Their attitudes towards local publishing will only change when rules for promotion in mother institutions change to favour local publications and when African published journals are recognized globally as sources of credible research information.

Many African university libraries have embarked on building institutional repositories (IRs) to show case their research output. Many of the institutional repositories are populated with theses and dissertations. There is need especially in technological university libraries to show case faculty’s research output, consultancies and market research reports, and collaborative research with industry. Technological university libraries are in a unique position to take a leadership role in promoting scholarly communication initiatives and to aid in making scientific information more
accessible (Turtle and Courtois, 2007) to various sectors in the African economies. Africa has a large number of universities (both private and public), research institutions, and agricultural research systems (NARS) that could play a leading role in scientific and technical content development and dissemination. African universities are pioneers in the use of the internet, and can also take a leading role in scientific content development and dissemination (Chiware, 2007). Moahi (2009) also points out that “those institutional repositories have been shown to be an important part of a university or research institution in that they enable a central location for an institution’s output and in the process enhance the visibility of the institution”. Institutional Repositories also provide an avenue for the preservation and archiving of an institution’s research output.

**Community engagement**

Universities of technology are embracing the idea of social and community engagement as one of the important institutional goals. The universities see themselves as institutions with a greater commitment of service to, and upliftment of the community than has previously been the case with traditional universities (Du Pre, 2009). The idea behind community engagement in many institutions is to work closely with communities and plough back ideas for development and employment creation through partner programmes. It is also to work with industry, commerce and government so that students can have the opportunity to engage in practical work and gain exposure to industrial practices before they graduate.

Universities in Africa have always been viewed as ivory towers open only to a privileged few. The university of science and technology has a role to change these perceptions by playing a more leading role in researching and implementing appropriate community technologies to address challenges in poor African communities. The university library engages in various communities' information projects in order to support this important institutional goal. There are various types of community projects that the library could engage in including information support to informal sectors, and to small and medium enterprises (SMEs), which are important employment creating sectors in developing countries. They could also engage in information provision activities to lifelong educational programmes, health and agricultural community initiatives, which support the welfare of the general populace.

Community engagement activities of technological university libraries in Africa could also include support to communities to set up information centres, donation of weeded library materials, and training community information leaders. In addition community engagement programmes by the technical university library should also be seen as a way of sourcing more funding for the library information activities. By engaging various key economic players in industry, commerce and the non-governmental sector, the library could build partnership that supports its role in the parent institution. Many leaders in industry who are responsible for R&D want to be assured of a body of knowledge to support their work and with limited resources in their own companies academic libraries will be their nearest and reliable information partners.
Supporting innovation and entrepreneurial development

The cultivation of innovation and entrepreneurial development programmes are also important goals in many universities of technology today. According to Du Pre (2009), “a number of universities have opted for developing a community of skilled graduates with relevant and specialized knowledge and skills contributing to the modernizing economy through technological innovation and technology transfer, entrepreneurial development and the application of knowledge and technology and stimulating economic growth and prosperity”. Special units for business and entrepreneurial development information can be incorporated into academic libraries at a technology university. This will assist students in their final years to start planning about how to go into self-employment if they choose that route. In relation to other entrepreneurial development efforts in other university units, the university library must then develop guidelines as to how an information centre on innovation and entrepreneurial development operates in a library in relation to these other initiatives to avoid duplication of services.

Related to supporting innovation and entrepreneurship, is support for science and technology parks by university libraries in science and technology universities. Science and technology parks have been established in developed countries as partnerships between industries and academic institutions and the main objective is to foster research for product advancement and innovation through knowledge partnerships. In Asia there has been active collaboration between universities of technology and industry since the economic boom of the 1980s. This involved short term activities such as providing training, short courses and consultancies, and conducting research and development for the industrial sector. This has eventually been formalized in the creation of science and technology parks. The involvement of university librarians in the setting up of a technology park in Thailand was initiated by librarians who wanted to play a role in the provision of information services to tenant companies. In the end a model was developed based on research on the information needs of, seeking patterns and the types of information services for these small companies (Premkamolnetr, 1999).

In Africa discussions and plans are slowly emerging on the establishment of science and technology parks to partner with universities as a way of promoting entrepreneurship, innovation and industrial development. South Africa has to date established the Innovation Hub as Africa’s first internationally accredited science and technology park. Similar efforts are underway to increase innovation hubs across South Africa. At the continental level, Unesco launched a pilot project in 2008 for the development of a science park in an African country. Nairobi, the capital of Kenya, is to host this science park, which will serve as case study for establishing technology parks across Africa. The project will develop a body of good practices and guidelines, which will then be disseminated widely to national programmes (Unesco, 2009). For this to succeed several key players like the ministries of higher education, industry and commerce, science and technology have to be actively involved.

The university library is in a position itself to take a leading role in the establishment of information services to tenant companies in science and technology parks through investigating their information needs, information seeking behaviours, information sources and the kind of services that could be offered. Technological university libraries should position themselves to become technical information
centres supplying a range of information services to assist innovation and entrepreneurial development.

By encouraging new partnerships and services to co-locate in the library, the library itself becomes an engine for change and new collaborations within the institution and adding value to the services provided in support of learning and research. These partnerships and services also bring new expertise to the library, which can and will be leveraged to increase the overall value of the library even more (Maes, 2005).

**External partnerships**

A vibrant technological university library participates and engages in national, regional and international activities. These activities expose library staff to new international practices in the library and information science field as well as providing an opportunity to benchmark the African technological library to international standards. Library staff members who are well traveled often bring back home ideas of how to improve library services. They also have the opportunity to share their own experiences with people in other regions of the world. At the international level, the International Association of Technological University Libraries (IATUL) provides a platform for technological university libraries to share information and collaborate on a number of activities. African technological university libraries have a presence in the IATUL activities and should take advantage of its many collaborative activities to ensure more international exposure.

Other international organizations, which provide platforms for African technological university libraries to share, and collaborate include the International Federation of Library Associations (IFLA), and the Commonwealth Library Association (COMLA). IFLA’s various programmes and regional activities provide an opportunity for development for African university library staff. Participation in national library association activities is also another way of growing staff in libraries. In many parts of Africa library associations face challenges of recruiting members and lack resources to run programmes. At regional level, there are organizations like Standing Conference of African National and University Librarians (SCANUL) the Standing Conference for Eastern, Central and Southern African Libraries (SCECSAL), and the Association of African Universities (AAU). Again these platforms provide opportunities for African academic and research libraries to share experiences and collaborate in areas of mutual interest.

Library consortia are growing in some parts in Africa, notably in southern Africa and in South Africa in particular and lessons from this country shows how university libraries have managed to work together for the benefit of their users. As international suppliers of electronic information are becoming more aggressive and complicated with their product pricing structures and business models, it is important that libraries speak with one voice to maximize returns on investment and technical university libraries need be part of that voice.

**Measuring the effectiveness of services through research**

The technological university library must develop effective measuring mechanism of services it renders in support of the mission and goals of the university. One way of achieving this is through library research carried out by its own staff into various areas of service delivery, and in issues that are relevant to the profession and national
development (Msuya, 2002). According to Swanepoel (2005) for a library’s research strategy to succeed, “it should comply with a number of conditions such as that, the research has to be relevant and beneficial to the university, library and research participants, the research process should develop research experience and build capacity, the research technique should be relatively easy to apply, involvement in the research activity should create lasting enthusiasm and the process should be dynamic”.

While the development and implementation of research agendas in university libraries in Africa is not common, it is one way of encouraging staff to evaluate services through structured research and presenting results in publications like journals, conference papers, and workshop presentations. A clearly defined research agenda for an academic library will provide clear guidelines as to the areas that need to be researched, the research approach and expected outcomes. The research agenda for the library will also serve to raise its profile among faculty as a true academic partner that is involved in serious research activities to measure the effectiveness of services to the university community. The benefits of a well thought out university library research agenda will contribute be “to create new knowledge and thereby contribute to the growth of LIS profession … to improve problem solving and decision making in the workplace … and to make professional practitioners critical consumers of research literature, to better equip librarians to provide optimal information services to researchers in other fields” (Powell et al., quoted in Swanepoel, 2005).

Conclusion
The academic library in Africa remains an important academic partner despite the many challenges of funding, skills shortage, and IT infrastructures that it faces. Its role in human resource development might not be so clear, but successful skills development is very much dependent on the support that libraries play in higher education provision. While the information landscape is continuously changing and faculty and students demand new and better ways of accessing information, the library still remains an important intermediary. In Africa students and faculty continue to look up to the library to provide the space and facilities to access information. With limited public and special library facilities in communities, government departments and the private sector, the academic library in Africa remains an important source of information for many types of users and hence its role in human resources development is enhanced. Through its community engagement projects the university library plays a critical role of supporting the informal sector and small, medium and micro enterprises with business and technical information services. The sectors are seen as engines of economic development in Africa. The technical university library in Africa is also an important player in the emerging documentation and creation of digital platforms for local scientific and indigenous knowledge and being the bridge between scientific knowledge from global institutional academies and international information vendors to African scholars, researchers and communities.

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Further reading

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