Sustainability in Academic Libraries
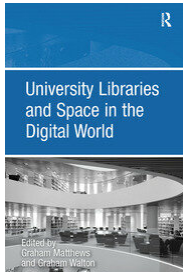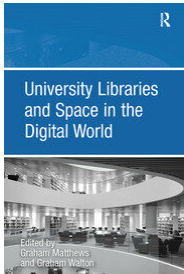
Academic Libraries' Efforts to Create a Sustainable Future

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Contents

Chapter 4

Library Space and Technology

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Introduction

Libraries have dealt with the impact of technology on space for decades. This chapter will first provide a historical perspective before focusing on current trends. While developments have overlapped, it is proposed that there are three main periods of technological innovation. The first is the use of technology to automate backroom processes such as cataloguing, acquisitions, and serials control. This period extends roughly from 1960–1980 for the initial applications with further, though often less important, developments since then. The second period is the arrival of the online catalogue in the period from 1980–1994, as well as the efforts at retrospective conversion that allowed the disappearance of the card catalogue. The third and principal period starts with the arrival of the Internet and extends to the present. The full implications of the Internet on library space have yet to be seen, but substantive changes have already occurred. In general, larger academic libraries in the developed world have been the first to embrace new technology, while smaller libraries everywhere and libraries in the developing countries have mostly introduced technology more slowly, most often due to budget constraints.

This chapter is written from an American perspective, and is based upon over 40 years' experiences as a librarian and library educator since 1971. The context will be provided by documentation and literature from many sources and the focus will be on academic libraries. Before this focus, the changing use of physical space in special, public, and school libraries will be considered. Special libraries have often been in the forefront of adapting to technological change for several reasons. First, for-profit corporations are more likely to introduce new technology that ultimately reduces the cost of providing services or that makes it possible to generate additional revenue as these changes benefit the bottom line. Second, space is often at a premium in the corporate environment, especially in large, expensive cities such as New York, London, Paris, and Zurich. Third, the Internet has permitted the consolidation of library services for companies with multiple locations so that a library at corporate headquarters has often replaced multiple physical libraries.

> Technology often permits special libraries to reduce the size of the collection and allows library space to be reallocated … As digital information has become ubiquitous, the role of the physical library space as the repository of information,

and the role of the librarian in maintaining the order and accessibility of the information resources, has been replaced by networked access from anywhere. (Shumaker 2009)

Public libraries will initially benefit less from technology in reclaiming space. Since, at least in the United States, they receive their funding from local communities, they must satisfy the needs of both technologically advanced and technologically limited users. Meeting the needs of both types of user may put additional pressures on their space requirements and budget (Holley 2010). Finally, school libraries benefit greatly from technology, especially with the great increase of available resources; but most school libraries are so small that even the systematic introduction of technology will not have a great impact upon their space requirements. A contrary view does, however, emphasize the benefits of repurposing even the limited space freed up by removing print collections (Corbett 2011).

Automation of Internal Processes, 1960–1980

Not all technology depends upon computers. The equipment needed to read microformats had the greatest impact upon space needs during much of this period. The library needed to provide machines for reading the various formats both in technical services for processing and in public areas for reading. In addition, the library had to purchase storage space for the physical copies of the microformats. Libraries purchased microform versions of some materials, especially newspapers, because preserving the paper original was difficult. During much of this period, libraries were expanding. Many academic libraries were new and wished to create depth in their collections. Since they had the money to do so, many microform publishers created major microform sets such as *Early English Books* and *Landmarks of Science*. These collections required some space but much less than if these expanding libraries had been able to purchase even a small percentage of the materials contained within these collections. While the two most common formats were microfilm and microfiche, some publishers also used specialized formats such as microopaques, requiring libraries to provide multiple types of reader and to devote space for their use. 'In the 1970s the information explosion forced libraries and institutions and their users to microforms as an alternative to bulky expensive print materials. Improved film, readers, viewers, reader-printers, and the advent of portable lap readers made this money-saving choice more acceptable' (Heritage Microfilm 2010).

While libraries began experimenting with computers from the late 1950s, the first efforts were mostly batch processing that had little effect upon the space needs of the academic library. Most of these systems used punched cards and would require at the most one or perhaps several keypunch machines in the library. A separate computer centre would most likely process the punch cards and then

return any final product to the library. Some products were in a microformat and were read on the microform readers described above or had their own dedicated readers.

The use of technology for online cataloguing had the greatest space implications during this period. OCLC was incorporated on 6 July 1967 (Kilgour 1969). OCLC provided the opportunity to make use of cataloguing records stored on the OCLC computers in Dublin, Ohio in the MARC record format that was developed at the Library of Congress under the supervision of Henriette Avram. OCLC soon began to offer its services beyond Ohio to all types of library, and quickly attracted a large number of members. The Research Libraries Group, founded in 1974, emerged later as a competitor with an emphasis upon providing shared cataloguing and other services to large research libraries (OCLC n.d.).

During this period, libraries mostly used cathode-ray terminals (CRTs) and dedicated access lines for online cataloguing. The CRTs and dedicated access were expensive enough that cataloguers shared the CRTs. The cataloguing departments needed to allocate some space, depending upon the number of CRTs, for online cataloguing. Since each library employee still needed personal space to work, catalogue units needed to find additional space for online cataloguing. The OCLC and RLG databases soon proved themselves to be valuable resources for other library activities. Acquisitions and serials staff could use the online databases for verification, though specific subsystems for these two areas appeared later: 1978 for acquisitions (Schreiner 1978) and 1977 for serials (1977). In 1976, Joe A. Hewitt (1976) published an excellent summary of how libraries used OCLC in its early years, including a photograph of a communal work space with its cluster of CRTs.

Online cataloguing initially did not have much effect upon public space in libraries. Libraries initially used the OCLC online system to print catalogue cards that continued to be filed in public and other specialized catalogues. Only after libraries believed that they had a sufficient number of online records did they offer online OCLC access to their patrons. This public access started to occur around 1984, and online public access to OCLC had little effect upon the use of space in public areas during this period (Bills 1984).

Arrival of the Online Catalogue, 1980–1994

The major event during the next period, 1980–1994, was the general adoption of the online catalogue. According to Christine Borgman (1996: 499),

> … it is generally acknowledged that the first large scale implementations were at Ohio State University in 1975 (Miller,1979) and the Dallas Public Library in 1978 (Borgman, 1978; Borgman and Kaske, 1980). By the early 1980s, a sufficient number of online catalogs were in place in the United States for the

> Council on Library Resources to commission a major study of online catalog usage. (Matthews et al., 1983)

Almost all libraries embarked upon retrospective conversion projects to increase the coverage and number of records in the online catalogue (Schottlaender 1992). (This volume includes an extensive bibliographical article that lists publications on retrospective conversion from 1980–1990 by Daphne C. Hsueh (1992).) While larger libraries had more resources, they almost always had large, older collections whose records needed to be converted to machine-readable records. When they made the online catalogue available, they often had to retain the card catalogue, usually without adding cards for any acquisitions since the arrival of the online version. As with the initial internal automation, the online catalogue required more space because the card catalogue remained while a location had to be found for the new online terminals. Once the library 'closed' the card catalogue, some libraries compacted the catalogue to save space and sometimes reclaimed the prime location that it occupied by moving it to a less visible spot. As libraries completed retrospective conversion, they most often removed the card catalogue to discourage patrons from using an obsolete tool (Bausser 1988).

The online catalogue also offered the possibility of saving space in technical services. With the improvements in technology, some library employees began to get their own computers on their desks, though they were quite primitive by today's standards. Many libraries networked these computers and even provided access to BITNET and other systems that were precursors of the Internet. The bibliographic utilities also offered online modules for acquisitions and serials, as did most online catalogue vendors, who started to call their online catalogues 'integrated library systems' (ILS). The space formerly used for shared computer clusters became available for other uses, as did the space given over to specialized files that could now be discarded. A 1999 publication, *Planning Academic and Research Library Buildings* by Leighton and Weber, includes a section on space planning for technical services areas and specifically mentions the removal of old card files like the shelf list and the possible decentralization of serials check in (Leighton and Weber 1999).

The increased productivity of shared online cataloguing, coupled with a decrease in the purchase of monographic materials by many libraries, led to significant reductions in cataloguing staff and somewhat lesser reductions in acquisitions and serials staff. At a practical level, this space was often difficult to convert to public use because of its normal location behind the scenes, often away from existing public services areas, but could be used for internal library activities or for storage.

Beyond the online catalogue, the advances in technology had little effect upon public services. While Dialog was available as an online search tool, this service was expensive enough that librarians often did the searches for patrons. The one or two workstations used for this searching did not require much extra space.

The Internet and Massive Change, 1994–

After a long period of relative stability in libraries, the Internet caused massive changes. While precursors to the Internet had existed since the first ARPANET connections in 1969 (Guice 1998), the appearance of graphical browsers led to the rapid growth of the World Wide Web. While the exact date of the birth of the Web is subject to debate, 1994 would appear to be the pivotal year, with growing public interest in the Internet. Few initially imagined the broad changes that the Internet would bring to all aspects of our lives, including significant changes in the use of library space. Various themes emerged that are interconnected in their effects upon libraries and their space needs.

Advances in Connectivity

The increase in connection speeds and connectivity has had a profound effect upon all aspects of Internet use. At the beginning of this period, most users still used modems that connected at extremely slow speeds over telephone lines. These slow transmission speeds inhibited the use of graphic-rich Web pages and made use of some Internet resources a frustrating experience. By 2011, in contrast, many users had multiple high speed options including cable, DSL, and satellite that could be delivered in a variety of ways, including fibre optics. Many research libraries had access to Internet2, with some providing speeds approaching 100 Mbps. This means that the bottle neck is most often no longer the Web connection but the processing speed of the Web site. In comparison, 'slow' home access in this area is rated from around 1.5 to 18 Mbps.

   Users also have greatly increased options for accessing the Internet. At the beginning of this period, the standard access tool was a desktop computer with either Windows or Macintosh software, with some still using DOS or Linux. By 2011, users could access the Internet through a broad array of devices including the traditional desktop computer, laptops, netbooks, and smartphones of all types, as well as specific purpose devices such as game consoles and eReaders with added Internet connectivity. Prices have also plummeted for these devices. An entry level netbook can cost a little over $200, while desktop PCs and laptops start around $400 but can sometimes be bought for less. A smartphone often costs very little as long as the users purchase bundled access. (On 16 September 2011, according to Google Shopping, the cheapest new netbook cost $125; a laptop cost $198; and a desktop $178. All these devices would be considered underpowered by most users so the prices above more accurately reflect the standard models.)

   A third factor was that most of the devices above had the capability for wireless access. Students, faculty, and staff had laptops, phones, and eReaders that could connect to the Internet with this wireless access. Even staff could get by with wireless access, though most libraries still had wired access at staff desks from the pre-wireless period.

These two technological advances have had extensive implications for space needs in academic libraries, either directly or indirectly. The increase in connection speeds has allowed libraries to provide remote access for large files, including documents with extensive graphics. The document or file that would have taken a frustratingly long time to download or display now appears almost instantaneously. Many users no longer have any need to come to the physical library to access digital resources. This is because of the increased connection speeds made available by the various Internet service providers at a reasonable cost and the availability of cheaper devices to make these connections. Furthermore, many colleges and universities have implemented or increased their distance education offerings. While many provide some access to physical resources, the vast majority of these students rely upon digital resources and do not make use of library services other than those provided remotely. To give some statistics, 'in 2007–2008, about 4.3 million undergraduates, or 20 per cent of all undergraduates took at least one distance education course' (IES National Center for Education Statistics n.d.), while in 2009, *The Chronicle of Higher Education* estimated that 2.14 million students were taking only online courses (2010).

The availability of higher speed Internet connections for users, coupled with the drop in cost for ways to access the Internet, has meant that many more users are able to access the Internet remotely. At the beginning of this period, users most often had to come to the physical library to use library resources because online connections were too slow or too expensive outside the library. In addition, many academic libraries took responsibility for providing Internet access and sometimes other capabilities such as word processing, spreadsheets, presentation software, and other tools needed by students to complete their coursework. Many provided the space and funding for computer labs that were almost indistinguishable from those in non-library locations, though some libraries made attempts to limit at least some terminals to library use. Some academic libraries, especially publicly funded institutions and community colleges, provided Internet access for the surrounding community as an outreach initiative. In a recent paper, an experimental two-year programme at the University of Arkansas at Little Rock is described (Dole and Hill 2011).

The positive news for library space needs is that many academic libraries can reduce the numbers of computers that they make available because fewer students and other patrons will need them. As early as 2009, it is reported that 'more than 11 per cent of colleges and universities are either phasing out public computer labs or planning to do so [and] at colleges that have not pulled the plug on their labs, nearly 20 per cent are reviewing the option' (Terris 2009). Interestingly enough, however, the same article states that many colleges and universities are repurposing computer labs as communal space. While the quote above refers to general purpose computer labs, the same general principles will apply to those in the library that are often used as general computer labs rather than for library-specific reasons.

On the other hand, libraries will need to make sure that they provide reliable remote access and also wireless access within the library, because many users will prefer to use their own devices even when they are within the physical library. With reliable and speedy wireless access, libraries should not need to worry as much about providing publicly accessible data ports. Another major space issue will be providing laptop owners with electrical outlets, since many will prefer not to drain their batteries while using the library's wireless connection. Providing enhanced electrical outlets could be a major issue in older libraries. The same rules should apply for meeting rooms within the library, since bringing a laptop to meetings has become a common occurrence. One stopgap measure is to provide extension cords with multiple outlets. Overall, '[u]se of all of this equipment has implications for the need for electrical outlets and network connectivity throughout the library facility since some users will do their work inhouse. In addition, students who bring their own devices need access to electrical outlets in order to recharge their own equipment' (Lippincott 2008: 3).

One major caveat before reducing the number of computers or closing public access computer labs is to consider digital divide issues that could affect some members, mostly students, of the library's user community. Libraries within colleges and universities that require students to own laptops will be much less affected by this issue, though some students may wish to complete computer tasks in the library at times when they do not wish to bring their computers with them. Terris (2009) states that 'the vast majority of students at four-year-colleges—83 per cent—own laptops, according to Student Monitor, a market-research company' and quotes Kenneth C. Green (founding director of the Campus Computing Project): 'It's amazing that labs haven't died out yet … It would seem like an obvious area to save money, but schools keep insisting they are finding value.' This decision to cut costs and reclaim space overlooks a substantial minority, 17 per cent of the students, who did not own a laptop. In addition, some of the 83 per cent may own computers that are too old to access library resources effectively, or may not have a high speed Internet connection at home. Furthermore, these students may be those more at risk for dropping out of college if financial constraints are the reason for not owning a laptop or having a high speed Internet connection. In fact, community colleges, whose mission is to provide affordable education at the local level, are most likely to have decided not to eliminate computer labs (88 per cent) compared with the other types of colleges and universities (48–69 per cent) (2011c).

Collections – General Considerations

Since the arrival of the Internet, the changing patterns in collection building have had the most effect upon library space needs. As more digital resources have become available, academic libraries are collecting fewer physical materials and are often discarding parts of their physical collections. According to the most recent Association of Research Libraries' statistics, published for the years 2008–

2009, the 113 largest academic libraries are spending a median of $5,870,147 on electronic resources. The percentages of the collection development budget range from a high of 85.40 per cent to a low of 14.33 per cent, with a median of 58.29 per cent (Kyrillidou and Shaneka 2011).

The reduction in budgets for almost all academic libraries has exacerbated the decline in the purchase of print materials. Especially when coupled with inflation, libraries have lost purchasing power. Some academic libraries have even experienced declines in absolute funding (2009). These cuts have had a disproportionate effect upon space needs because most libraries have focused the cuts on physical book purchases for reasons that will be discussed shortly.

Before a discussion of various types of library material, some general comments are in order. Digital resources are popular with users for many reasons. They are available 24/7, unlike the unavailability of physical resources when the library is closed. Users can access them remotely with many different devices. In most cases, users can download the items for later use and can often annotate them digitally. They can also print them out, albeit at a cost, if print is the preferred format. Digital resources can feed data into documentation software such as Endnote and RefWorks. Finally, online students prefer digital resources because they cannot easily come to the physical library if they live a significant distance from the campus. As for negatives, users may have to deal with multiple searching conventions that can vary subtly from platform to platform so that what works in one digital universe may not work in another.

Digital resources also offer advantages to libraries. They cannot be lost, stolen, mutilated, or not returned at the end of the checkout period. Processing is simpler since the purchase of many items includes the needed bibliographic tools. The library no longer needs to check in physical serials, or to worry about claiming missing issues. Libraries can digitize their own resources to make them much more available to user communities around the world and to eliminate the majority of physical handling with its potential to damage rare or unique items. Digital resources also have some disadvantages. They require the necessary telecommunications, hardware, and software, and can be made unusable by malfunctions in any of these three components. The complex pricing and licensing agreements make them more difficult to purchase as publishers and vendors grapple with finding appropriate pricing strategies. Furthermore, the purchasing of bundles of materials, the 'big deal', makes budget reductions by cutting unwanted materials in the larger packages almost impossible. While not a scholarly resource, Wikipedia presents an excellent discussion of digital resources, including their advantages and disadvantages for both users and libraries (2011b).

While the subject of this chapter is space, it can be argued that space considerations did not factor all that much in the decision to go digital. The rationale presented for the increased focus on digital resources centre on better service to users. The realization that digital collections were reliable enough to allow libraries to modify their physical collections came relatively late in the period. Some librarians still worry about the permanence of digital records, the

ability for them to be modified without the permission of the owners or leasers, the quality of the illustration, and the changing content of packages as the copyright owners add or subtract resources. Perhaps the greatest concern has been the fact that libraries license rather than own many digital resources so that they disappear the first year the library cannot afford to pay for them, unlike physical resources that become part of the library's permanent stock (Currall and Moss 2009).

Collections – Reference Materials

The Internet has killed almost all need to collect print resources for ready reference. Librarians and users turn to Google, the other search engines, Wikipedia, and more specialized free resources for quick answers. The more definitive reference sources purchased by libraries for years have almost all gone digital and update their content continuously in a way that was impossible for print resources (Singer 2010). The library no longer needs to purchase the current resource and then later on purchase an expensive cumulation to save users from having to look through multiple volumes of the index. Some libraries feel the need to retain older reference sources. Furthermore, some reference resources are not available in digital format, such as the *Encyclopedia of the Israeli-Palestinian Conflict*, though print only is becoming much less common (Danford 2009). One complication for some libraries is the change in the pricing structure for digital reference resources so that large libraries pay more based upon the number of users in comparison with the fixed price for the print resource.

The digital world has allowed indexing and abstracting services to become content providers so that many of these former reference sources have blurred the line between access and content by providing full text for many of the resources that they index or abstract. Even when these resources do not provide full text, libraries use article linkers such as those provided by EBSCO, OCLC, and Serials Solutions to provide quick access to the digital and physical items in their collections. Many libraries have provided training materials on how to use article linkers, including this YouTube video from University Libraries, Wayne State University (University Libraries, Wayne State University 2011).

Most libraries have reclaimed significant space by eliminating or reducing their reference collections (Lampasone 2008, Singer 2008). Possibilities include discarding the materials, sending them to the circulating stacks, or putting them in a less valuable location. Some reference sources are retained only because professors of library science give assignments that require their use, but these reference tools are now located in low profile space.

Collections – Journals and Journal Articles

Libraries now have multiple ways to purchase journals and the articles they contain. They are available as individual purchases of the journal, as part of large or small packages of journals, as contents of various databases, and as packages of articles,

usually on a specific subject though this last option is quite recent. One negative of the multiplicity of possibilities is that the library may offer multiple options for the same item with different content, coverage, and access conventions.

Initially, online access to journals was considered an add-on to the physical print subscription, normally at only a slight additional cost, if any. In the author's opinion, the tipping point was somewhere around 2002 when the increased use of digital resources made the online version more important than the print one. Online-only journals have become increasingly important, though they have little effect upon space need. Libraries were initially uncomfortable in cancelling print subscriptions, even with the direct and indirect savings that such cancellations would bring. Libraries worried about the loss of access to important journals. The publisher might go out of business, and no one would be willing to support continued digital access. The library might have 'leased' the digital content and did not want to be locked into purchasing the content each year to obtain access to past purchases. They also worried about the issues covered in the introduction to this section (Walters 2004). The increased realization that digital journals were here to stay has allayed some of these concerns. Some additional options for guaranteed access included storing physical or digital copies in a secure location beyond the control of the publisher (Luther et al. 2010).

Academic libraries have reduced, often significantly, their print holdings of journals. They continue to receive some popular materials in print format for recreational reading or for the importance of the graphics, though they have most likely stopped binding these issues. Whalen (2009) discusses the importance of the quality of graphics for art historians. The first effect of the reduction in print subscription is reclaiming the space that was used to make current issues available. A more important consideration has been what to do with back files, especially for those journals where the publisher has digitized the complete run. Some libraries have simply discarded the back files on the assumption that they can get copies through interlibrary loan or by paying a fee for digital access to select articles (Zambare et al. 2009). Other libraries have put the back files in institutional or cooperative storage. Removing back runs most often results in considerable space saving.

Collections – Books

While digital books (eBooks) have been available since 1971 with the creation of Project Gutenberg (Zakon 2010), this format was the last to be extensively collected by libraries. Various reasons can be established for this delay. Unlike journals, where one decision to purchase usually meant continuing revenue for many years for the publisher and the aggregator, libraries normally purchased books individually at a lower unit cost without any continuing obligation. For the publisher, the sale of one book produced less revenue while still requiring the overhead costs of digitization and acquiring copyright. In addition, both libraries and their users faced the complexity of proprietary formats. While some are more

open than others, the Wikipedia article on the *Comparison of Ebook Formats* lists around 30 different formats (2011a). While users seldom subscribed to digital journals or even bought individual articles, many wished to have digital books that they could read on their proprietary devices. Finally, many publishers hindered the growth of digital books by requiring libraries to follow the rules for physical collections including allowing only one copy in circulation, a rule that made little practical sense in the digital age but may have increased publisher revenues if the library required multiple copies.

It could be proposed that the tipping point for digital books occurred as recently as 2009–2010. Various aggregators such as NetLibrary (http://www.netlibrary.net) and Ebrary (http://www.ebrary.com) now provide extensive collections. Libraries can enter into agreements whose terms allow adding the complete collection of eBooks into the ILS with purchase occurring only when a patron uses a digital book for a defined amount of time or number of accesses. Some vendors also allow multiple circulations of the same item. Finally, some vendors provide static collections where the library will own in perpetuity all purchased items while others offer dynamic collections, especially in areas such as computer science where older materials are less useful.

Before considering library space needs and books, two more factors enabled by the Internet must be considered. Google Books, if the legal issues can ever be resolved, offers the enormous benefit of offering access to millions of books in digital formats or as print-on-demand. Other resources for digital books are the Internet Archive and the Hathi Trust (Dougherty 2010). The second factor is the possibility of purchasing books in the out-of-print book market, where the availability of materials approaches 95 per cent (Holley and Ankem 2005). Many libraries, even research libraries, no longer need to build large collections 'just in case' but have a reasonable assurance of meeting patron needs for research materials 'just in time'. The whole concept of patron-driven acquisitions is built upon this model of probable reliable access to the monograph publications of the last two centuries (Hodges et al. 2010).

Purchasing current eBooks does not provide additional space but makes it possible to avoid finding new space for current purchases. Digital books may, in fact, help solve the problem of finding funds for expensive new construction. Furthermore, except for popular materials, libraries may defer purchase of more advanced research materials on the expectation of being able to find these items if needed in print format from the out-of-print market or in digital format from the eBook vendors or from Google Books. Furthermore, some libraries are reclaiming space by weeding their monograph collections. As with journals, some libraries are storing these books either on site in less prime space or at individual or cooperative remote locations. Other libraries are discarding many items on the reasonable assumption of being able to acquire them again in the ways indicated above or through interlibrary loan. It may be that most libraries will reclaim less space from books than from journals. Digital journal access will remain more

reliable, and also identifying individual book titles is more labour intensive for the space reclaimed than doing the same for journal titles (Soma and Sjoberg 2010).

Collections – Special Areas

Libraries may reclaim some space in the microforms area from the availability of digital replacements for long microfilm runs such as the *New York Times* and *The Wall Street Journal*. While microfilm reader and copy technology have advanced considerably, most readers prefer digital content so that relatively few microform readers are needed in most libraries. Many media are now available on the Internet or can be streamed to computers for free or for a cost determined by the type of material. Most academic libraries have not extensively collected media, so space savings from this technological change will be slight.

More libraries are saving space by significantly reducing their collection of government documents. The first reason for this reduction is due to technology, as more government agencies are publishing their documents in digital form. Budget reductions provide the second reason, since staff cutbacks have made libraries less willing to process government documents and to comply with the stringent rules that the government imposes upon libraries with depository status. Finally, other digital resources may provide the information that was formerly available most expeditiously from government publications (Hernon and Saunders 2009).

The digitization of rare and archival materials in special collections and archives makes it possible for some patrons to use these digital versions to avoid travelling to the repository where they require work space for their research. Some scholars, however, continue to need access to the physical documents for their research. Furthermore, the number of scholars using rare materials may increase as their availability becomes better known through their Internet presence. Overall, however, digital copies are most likely a plus for the preservation of rare and archival materials since fewer users will need to handle the physical artefacts (Dooley 2009).

Library Services

As indicated above, the Internet has virtually eliminated the need for ready reference. While libraries continue to feel the need to provide an in-depth reference service in support of student and faculty research, many have made significant changes in the way this service is offered. These changes can have significant space implications beyond the reduction already described of the physical reference collection. Some libraries have combined the circulation desk, normally staffed by clerical employees, and the reference desk (Wang and Henson 2011). Librarians may sometimes be stationed at this combined service point, but often the clerical staff have instructions to call a librarian to the desk or to send the patron to the librarian. It is also possible to schedule an appointment with librarians when the patron question requires a sophisticated answer beyond simple directional or

service requests. While only slightly different conceptually, other libraries have eliminated the reference desk and have librarians who roam through the building and campus or who are embedded within the faculty and student spaces on campus and within course software (Tumbleson and Burke 2010). Other libraries think it sufficient to provide instructions to users on how to contact a reference librarian in case of need (Nunn and Ruane 2011).

A new, more comprehensive solution is to implement an information commons/ learning commons where the library not only consolidates its services but also includes computer support and perhaps even other college or university services. One of the chief goals behind this change is to allow students to have many of their needs met in the same physical space without having to travel to different parts of the institution. Overall, such an arrangement makes effective use of campus space globally but might require the library to prove additional space for units that were not traditionally housed within the library. A book entitled *Transforming Library Service Through Information Commons: Case Studies for the Digital Age* by D. Russell Bailey and Barbara Tierney (2008) provides 20 case studies that discuss space planning for the information commons.

Technology has less effect upon the space needs of other library services. Self-service circulation might provide some space saving. Interlibrary loan (ILL) might require even more space if the library depends upon ILL to meet patrons' needs caused by the library's having a smaller collection. The digital collection and scanning possibilities have eliminated much of the need for photocopying machines. Cell phones have done the same for pay phones.

Uses for Space Savings

The library may or may not be able to retain any space savings for its own use. Colleges and universities always have need for more space for meeting rooms, offices, and other uses. Some libraries welcome giving up the space for these other uses because having students and especially faculty use space within the library can help position the library as a core function within the campus community (Tooey 2010). This advantage obviously does not apply if the library gives up an entire building or the entire space allocated to a branch library. If the library retains the space, the most common use is increased study space. With crowded, noisy dorms and long commutes, many students seek out a quiet space to study, especially if it is wired with the latest technology (Bryant et al. 2009). Some academic libraries have experienced increased gate counts even as the use of traditional library resources and services has fallen. Some question whether a better alternative would be to provide quiet study halls at a lower cost rather than keeping the library open with its traditional services and staffing patterns.

Current Status and Future Predictions

The space needs of academic libraries have been affected in various ways by the technological factors discussed above. They have choices in how they wish to implement the technologies and how radical they wish to be in rearranging their space. This concluding section looks at the status of space use today with some predictions for the future. The author moves from the most radical to the more conservative scenarios on a continuum.

Reclaiming Space by Eliminating or Drastically Reducing the Physical Library

Eliminating the library is most likely a possibility for branch campus libraries where a central library can still provide some library support. One example is the Medical Library at Johns Hopkins University that plans to shrink print holdings by 80 per cent by 2012. The librarians are now embedded in their departments and provide support through digital resources. The library has given the space back to the university to be used for other purposes and moved to a more remote location (Woodson 2010).

The Completely Digital Library

Another possibility is the completely digital library. In fact, the University of Texas at San Antonio (UTSA) recently announced the official opening of its new Applied Engineering and Technology (AET) Library, which, in a press release, it is calling 'the first completely bookless library on a university or college campus' (Rapp 2010). This new or remodelled library will provide access only to digital items but may have an Espresso Book Machine to provide on-demand print copies for patrons and may also have access to print collections from other libraries on campus. The optimal size of the library depends upon the number of patrons who wish to use the library and the willingness of the library to provide space for these users. As indicated above, many students seek a quiet space for study without extensive use of library services. The completely digital library may or may not provide a significant number of computers for patron use because mobile devices, wireless access for personal laptops, and checking out library laptops may eliminate much of the need for making desktop computers available.

Core Collection with Access to Research Materials as Needed

This scenario could extend from community and four-year undergraduate colleges to mid-size research libraries. These libraries will have a core collection of heavily used materials and provide access to research materials upon demand, 'just in time'. One issue will be the definition of heavy use, but the author would consider it to be at least one circulation every two years. The other chief factor is how many of these heavily used items will be digital and how many physical. As digital

availability extends to more and more items, this scenario may work out to be not much different from the completely digital library. Research materials will be acquired as needed from the storehouse of digital artefacts such as publisher offerings, Google Books, and institutional repositories, and from the print offerings in the out-of-print book market. Another decision will be whether the library provides a digital copy or a physical copy from the Espresso Book Machine when this is an option, and whether the library adds the digital or physical copy to the collection. Those libraries with special collections and archives will need to retain these physical collections as artefacts.

The Large Research Library

The large research library will most likely maintain larger collections of physical items with the space needs that these collections entail. First, the author hopes that some key libraries will take responsibility for current collecting in the disciplines where each library has the greatest strengths. The principle of 'just in case' relies upon someone somewhere having the copies to be shared. Second, the very large research libraries most likely will continue to collect to a depth that requires the acquisition of physical copies from countries where digital has not yet taken hold and from publishers elsewhere, mostly in the realm of grey literature, that see no need to make digital copies available and whose offerings do not have enough value for third party digitization. This prediction could prove wrong if these large research libraries decide to digitize these items on their own, but this decision brings up staffing issues and copyright considerations. Finally, some areas such as special collections where the original has intrinsic value and where details, important for at least some researchers, would be lost even with the best digitization will continue to require space for collection growth.

Conclusion

The advances in technology will at the very least slow the need for additional space in all academic libraries and may allow many academic libraries to shrink. While the availability of the Internet has led to some changes in services such as reference, the increased importance of digital collections is the main factor in the reduction of the need for space. Some libraries are already completely digital, while others will undoubtedly follow. Even the largest research libraries can reduce their journal holdings and substitute eBooks for a portion of their current acquisitions. Overall, the academic library no longer needs to define itself as a place where users go to access physical materials. Instead, the library has become a service point for providing users with the information resources and services that they seek even if they never set foot in the physical library.

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Chapter 13

Sustainability in the Library – 'Green' Issues

Graham Matthews

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Introduction

One of the more recent issues that is impacting on the design and functioning of university libraries is sustainability. This chapter, based on a literature search on the topic, provides an introduction to sustainability and green issues for university libraries; it draws mainly on circumstances in the United Kingdom, but also includes examples from elsewhere. It is intended that these will serve as examples of the kind of issues involved and how they are being addressed in this developing field. Others, too, affirm that this is a relatively new topic for libraries. Hurt and Findley (2011), for example, in a recently published encyclopedia article on library architecture and design, note that '[a] fairly recent trend in library architecture and interior design has been the emphasis on sustainable design, also known as greening the library'.

References to a range of sources are provided – these offer further information and illustrative material. Following the introduction and background information, the chapter focuses on three areas: buildings, building services, and library services and operations.

> The University [of Melbourne] is now two years into an ambitious programme of library redevelopments. Key deliverables for these new buildings and infrastructure are linked to the effective delivery of services to support the academic community but also high on the agenda as a key deliverable is reducing the environmental footprint to improve environmental sustainability in line with the University's environmental commitment, as well as maximising operational effectiveness in the current financially constrained environment. (Ellis and Kealy 2011)

The University of Melbourne is not alone in such activities, and the quotation above could certainly apply to other institutions. In recent years libraries, along with other institutions, have had to comply with the growth in legislation and regulations relating to 'green' issues. Dewe (2006: 159) has commented: 'Green library buildings are part of broader professional and social concerns that manifested themselves in the early 1990s as green librarianship'. More recently, Hurt and Findley (2011) have commented:

> A fairly recent trend in library architecture and interior design has been the emphasis on sustainable design, also known as greening the library. Librarians and architects share an interest in using building materials that emphasize recycled and environmentally friendly components, and design focused on energy conservation and effective use of materials that will not need frequent replacement.

Also:

> Interior designers seek finishes and furniture that are made from recycled materials, such as old tires or seatbelts, and from renewable resources such as cork and bamboo. Construction companies are developing more environmentally friendly ways of excavating the site and reusing or disposing of materials used in the building process.

Professional ethics demand an appropriate approach to sustainability. These are now central to the planning, building, and running of new or refurbished library buildings and services. Activities in this area to date can be categorized as those that address sustainability and the actual building and its component parts, the services that permit the building to function, and the library services and their operation. Thus, key areas to be addressed include the building, its structure and site, and energy efficiency (carbon emissions, IT provision, heating, ventilation, water conservation, waste reduction).

Background

In England, details of general government policy and action can be found on the defra (the Department for Environment, Food and Rural Affairs) *Sustainable Development in Government* website (defra 2012). With regard to higher education, a shared vision for sustainable development was published in 2010 (Simpson 2010). HEFCE, the Higher Education Funding Council for England, that 'distributes public money for teaching and research to universities and colleges' (HEFCE 2012) also promotes its strategy and actions on its website (HEFCE 2011). JISC, 'the UK's expert on information and digital technologies for education and research', has undertaken a strategic overview of managing sustainable ICT in further and higher education (Thomas, 2009). EAUC, the Environmental Association for Universities and Colleges (EAUC 2012), is the environmental and sustainability champion within further and higher education in the UK. There is also a ranking of performance available: the People and Planet Green League of UK universities ranked according to their environmental policies and performance (People and Planet Green League 2011), which is the only comprehensive and independent league table of UK universities ranked by environmental and ethical performance. It is compiled annually by the UK's largest student campaigning

network, People & Planet. In 2011, 142 universities provided People & Planet and the Higher Education Statistics Agency (HESA) with enough information to be entered into the league table (People & Planet 2012).

Individual universities have also developed their own policies and strategies which they disseminate widely. Loughborough University, for example, where this book's editors both work, provides a clear overview of its activities and achievements on its website. Topics addressed under *Sustainability* include: biodiversity, staff awareness, carbon management, energy and water, construction and refurbishment, curriculum and research, procurement, policy and strategy, press and PR, travel and transport, and waste and recycling. Links to a range of organizations' websites are also provided (Loughborough University 2012).

Thus, libraries in universities are working very much to the tune of their parent organizations. In some of these, libraries are taking a lead, and as such are proud to announce their achievements within and without the institution. As can be seen from the examples below, in the UK the Building Research Establishment Environmental Assessment Method (BREEAM® 2012) is highly regarded as an assessment method and rating system; in the USA, the LEED® (Leadership in Energy and Environmental Design) certification mark is one of the leading certificates (US Green Building Council 2011).

Buildings

The following examples illustrate aspects of new or refurbished buildings that have been designed and built to facilitate sustainability.

University of Belfast

> In building the New Library, the University demolished four undistinguished 1970s era buildings with flat roofs, lightweight external cladding and poor thermal insulation properties. These buildings were energy inefficient, and made little contribution to the quality of the campus and its wider conservation area. Their demolition allowed the construction of a new sustainable building. (RICS Awards 2010 Winners 2012)

University of Portsmouth

> The exposed in-situ concrete structure of the University of Portsmouth library extension, entered into the 2007 Concrete Sustainability Award, is integral to its success. It is a fundamental part of its strategy to reduce energy use (the project has achieved a BREEAM rating of Very Good) and to create a comfortable, stable climate for its users. …

The basic orientation of the building, the facade treatment and the use of rooflights maximise opportunities for good day-lighting. The south-west elevation facing the park is an echeloned series of massive concrete fins dividing window bays. Windows thus face due south, making it easier to mitigate solar gain, reducing glare from low east and west sunlight and creating triangular study bays alongside the stacks. The façade flanking the entrance with a series of vertical slot windows acts as a giant, welcoming sign, exposing the inner life of the building.

Constructed of cast in situ concrete using reuseable shuttering, the structure of the new building is exposed internally. It is insulated and weatherproofed on the outside and clad in a skin of limestone. A building of quality achieved under a Design and Build contract, the fully exposed, in-situ concrete structure to the new three-storey block simplified the construction process, meaning that the entire superstructure was in place relatively early in the contract, reducing the number of external packages and the need for layers of internal finishes. Service runs are fully integrated to reduce visual clutter. (MPA – The Concrete Centre n.d.)

University of Worcester – The Hive.

This is a fully integrated University and Public Library under one roof, to be opened in July 2012.

Construction techniques to minimize impacts on the environment:

- Existing buildings demolished and the resultant materials crushed and re-used for the piling mat.
- Piled foundations 'bored' as opposed to being 'driven' into the ground to reduce the impact on the archaeological features buried beneath the building.
- Recycled aggregate and GGBFS cement replacement used in the concrete frame to reduce embodied energy.
- Post tensioned concrete slabs used to reduce the amount of concrete and particularly the steel reinforcement required.
- The roof is built almost entirely of prefabricated timber panels, reducing on site wastage and site energy consumption.
- Over 75% of waste creating during the construction phase has been recycled.
- A proprietary system was adopted which filtered out the cement based sediments from water used on site. CO_2 was used to neutralized the filtered water before its disposal.(Worcester Library and History Centre n.d.)

See also (Fairman 2009).

University of California, Merced – Kolligian Library

LEED (Leadership in Energy & Environmental Design)

The Leo & Dottie Kolligian Library has recently been awarded LEED Gold Certification (Leadership in Energy and Environmental Design). Green design and construction practices result in environmental and economic benefits. For example, the building includes

- installation of water conserving fixtures to save potable water by up to 30% beyond the required Energy Efficiency Standards in California (Title 24).
- an HVAC (heating, cooling, fans & pumps) system free of CFC-based refridgerants or HCFCs to reduce ozone depletion.
- automatic regulation of interior lighting and HVAC systems to reduce energy costs by up to 47% beyond the required Energy Efficiency Standards in California (Title 24).
- use of buildings materials containing recycled content e.g. structural steel, insulation and carpet (up to 13.61%) and recycling of construction waste (87%).
- use of materials that minimize indoor air contaminants to be fully compliant with Volatile Organic Compounds (VOC) limits as required by the South Coast Air Quality Management District and Bay Area Air Quality Management District.
- daylit areas maximized for comfortable work and study conditions and to further reduce energy costs. (University of California, Merced n.d.)

See also (Skidmore, Owings and Merrill n.d.).

Building Services

University of Leicester

> University of Leicester library wins architectural excellence award
>
> Success for Leicester in RIBA EM Awards for Architecture
>
> … Key features include low energy consumption, maximum use of natural daylight and minimal need for air conditioning. …
>
> Key environmental aspects were high insulation levels, maximizing use of natural daylight and a mixed mode system with natural ventilation through a stack effect. Solar gain is counteracted by an experimental solar shade which incorporates 3 types of photovoltaic, a triple glazed 'solar wall' and conventional brise soleil and blinds. (University of Leicester 2008)

The key features are explained and illustrated by Fyfe (2010) in a conference paper to a LIBER Architecture Group.

University of Aberdeen

Some of the library's key design features include:

- The building utilizes a high performance facade, maximizing daylight whilst minimizing solar gain and heat loss.
- Rainwater harvesting system which collects rainwater and is used to flush WCs. (University of Aberdeen 2009)

'University of Aberdeen New Library will be certified BREEAM Excellent which proves that the building is designed to minimise long term running costs and energy use. For instance rainwater harvesting for use in the WC flushing and photo voltaic cells on the roof of the library will be incorporated, as will the integrated hybrid ventilation and a series of intelligent management systems to optimise the energy strategy. Moreover, the extensive glazing of the library provides high insulation standards and plenty of daylight combined with that from the central atrium', Stephen D. Willacy, Partner at schmidt hammer lassen architects clarifies. He stresses that sustainability is integral to the holistic design process of schmidt hammer lassen architects. (e-architect 2010)

Further information is available from news sources (Glancey 2012, STV News 2011).

Queen Margaret University Edinburgh Library

Sustainability is a central part of the ethos here at Queen Margaret University. Library Services are helping make QMU even more sustainable by utilizing new technologies and services to ensure this ethos is upheld.

Intelligent Energy Systems

The lighting and temperature within the LRC is controlled through the Building Energy Management System. Lighting will be automatically switched off where no movement is detected. The ceilings consist of exposed concrete slabs which absorb the heat generated during the day and then cool at night allowing the building to maintain a consistent temperature. Blinds are fitted to most windows which can be opened or closed when necessary. Opening windows are fitted in the main area of the LRC and in the IT Seminar Rooms to allow cooling during the warmer weather. (Queen Margaret University Edinburgh. 2012)

Library Services and Operations

University of Cardiff

Cardiff University Information Services, for example, announce:

> The University Library Service is making a significant contribution to the sustainability aspirations of Information Services (INSRV) and the University. A range of enhancements to several library buildings and the creation of effective learning spaces demonstrate this. More efficient working processes have also been introduced. (Cardiff University Information Services n.d.)

Several of these are highlighted: 'saving space and transport with electronic journals, electronic inter-library loans, more efficient library catalogue terminals, more efficient printing and photocopying, donating and recycling older books and journals', with specific detail provided, too.

University of Tasmania, Australia

The library of the University of Tasmania, Australia, illustrates its dedication to environmental sustainability by outlining initiatives it undertakes on a daily basis:

- Using Energy Star Ratings as a selection criteria for the purchase of technology
- Providing a standard 'Green' model desktop computer for staff
- Using recycled paper (minimum 50%) for printers and copiers
- Encouraging staff to turn off lights and monitors wherever feasible
- Shutting down multifunction devices, photocopiers and printers when the Library closes
- Using natural lighting where feasible or using fluorescent lighting otherwise
- Using video conferencing and car pooling where feasible
- Use rechargable batteries where possible
- Trialling desktop video conferencing and communications software
- When replacing existing printing and copying equipment, providing duplex printing options
- Providing paper and cardboard recycling to all staff and students
- Offering facilities and pickup for the
  - Recycling of toner cartridges
  - Recycling of batteries
  - Recycling of mobile phones
  - Waste Recycle Bins for glass and metal
- Collaborating with ITR for disposal of general eWaste on specific days
- Researching and evaluating new sustainable IT technologies and practices. (University of Tasmania 2012)

Conclusion

> The pursuit of sustainability targets in redevelopments at the University of
> Melbourne Library is undoubtedly good for the planet, but it is clear that this
> is not the only benefit to be derived from the implementation of building green
> infrastructure. After the initial investment, most sustainability initiatives are also
> beneficial for the financial sustainability of the library in managing the ongoing
> costs associated with maintaining and operating library buildings and services.
> Further, the opportunity to redevelop these spaces has permitted consolidation of
> library spaces and rethinking of service delivery models that are both cost effective
> and more attuned to modern university needs. (Ellis and Kealy 2011: 19)

This chapter has attempted to provide an introduction to sustainability and green
issues in academic libraries. The literature on the subject is relatively limited but
is beginning to grow as new and refurbished libraries incorporate these issues in
their design, fabric, facilities, and services. It is an area that will continue to have
an increasing impact on space in libraries.

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Academic Libraries in Cameroon: Achieving Agenda 2030 Goals

Roseline Bawack

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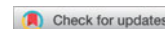
Academic Libraries in Cameroon: Achieving Agenda 2030 Goals

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Introduction

The success of any society, country, or institution greatly depends on the adequacy of its library collections, its infrastructure, and its dissemination policy. The library is seen as an organ for findings, discovery, innovation, vocational skills repository, scholarships, and research (Adeleke, Okusaga, & Lateef, 2002; Buchannan, 1994; Dada, 2016). Academic libraries particularly those of developing countries in Africa have been questioned about their role and efficacy in contributing towards the development of their countries in several key areas like quality education, ending poverty and hunger, improving living conditions of people, gender equality, access to water and sanitation, and healthy lives.

The Sustainable Development Goals (SDGs) have been identified by African countries as a tool within their wider development planning framework that will put an end to the tragic conditions experienced by many Africans and a move towards emergence. In the attainment of the SDGs, academic libraries have a critical role to play as individuals are given access to information in various formats without contradiction and discrimination. Seeing a great potential in the role of libraries in achieving the SDGs, many African countries have signed a declaration in support of providing the resources necessary to support the contribution of libraries in their nations (Bradley, 2016; IFLA, 2015). The mandate was that each of these member nations should adopt the International Federation of Library Association and Institution (IFLA) tool kit and benchmarks in achieving the SDGs.

The seventeen SDGs of the Lyon Declaration (2015) include the following with targets aimed at all spheres of development:

- Goal 1: End poverty in all its forms everywhere.
- Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5: Achieve gender equality and empower all women and girls.
- Goal 6: Ensure availability and sustainable management of water and sanitation for all.
- Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all.
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
- Goal 10: Reduce inequality within and among countries.
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
- Goal 12: Ensure sustainable consumption and production patterns.
- Goal 13: Take urgent action to combat climate change and its impacts.
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
- Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and

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reverse land degradation and halt biodiversity loss.

- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.
- Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Cameroon is a member of the United Nations and is committed to the attainment of the Sustainable Development Goals. The government of Cameroon recently launched a major reform of its higher education system to adapt to these changing needs. For the government of Cameroon to succeed in the realization of the SDGs, it needs assistance from all its stakeholders and ministries especially the ministry of Higher Education of which academic libraries are an integral part. Academic libraries in Cameroon convey an integral role in supporting higher education's core missions of research and education. They make open and freely available, research outputs of their institutions to the community and the world.

In the UN general assembly in September 2016 in New York, H.E Paul Biya, President of the Republic of Cameroon expressed support to the UN-SDGs for a "transformative" agenda that prioritizes the elimination of poverty and hunger, as well as sustainable and inclusive growth. He emphasized his country's commitment to attain the SDGs and reach emergence by the year 2035.

In Cameroon, higher institutions of learning are the producers of manpower upon which the successful implementation and monitoring of policies including those pertaining to SDGs could rely on. The roles of academic libraries of these institutions in training programmes cannot be overemphasized. They provide a good platform for all domains of human activities that want development and progress. They are a hub for research output, storage, and the gateway for effective dissemination. One of the criteria for categorizing a country as developed is the level to which it develops its information systems at various levels to achieve socioeconomic growth. This emphasizes the important role academic libraries can play to support the attainment of sustainable development goals, and justifies IFLA's engagement and determination to work with the UN 2030 Sustainable Development Goals to achieve its goals.

Cameroon has eight State Universities which are all under the ministry of higher education. The eight State Universities are the University of Bamenda, the University of Buea, the University of Douala, University of Dschang, the University of Maroua, the University of Ngaoundere, the University of Yaounde I, and the University of Yaounde II. There are also several schools, colleges, and professional institutions of higher learning all affiliated to these universities. The higher education curriculum in Cameroon spreads across all themes of the SDGs meaning that a lot of organized research on these themes can be found in dissertations, theses, and scientific research publications from its schools and faculties. The faculty of medicine and biomedical science for example, trains paramedics, nurses, pharmacies, and social workers that assist in the fight against HIV/AIDS pandemic, malaria, and other common diseases affecting the health sector. All state universities are expected to produce quality graduates that will address the challenges facing Cameroon as they join the labor market.

The academic libraries of these eight state universities and the role they play vis-à-vis their contribution towards the realization of the SDGs in Cameroon are under the spotlight in this paper. A major program currently being undertaken by one of these libraries that fall within government efforts towards the attainment of SDGs is what I am articulating here.

The contribution of academic libraries

The eight public universities, whose academic libraries are the subject of this paper, are the major producers of skilled manpower of Cameroon. They are all state-owned universities but do not enjoy financial autonomy. Like other academic libraries in the world, the libraries of these universities, as catalyst for change, were created to support the missions of their parent institutions which are mainly learning, teaching, and research. They support these activities in many ways: By engaging in consultation with the teaching department to acquire relevant information resources; by making these resources available to the patrons on long-term and short-term basis; by providing adequate opening hours; by teaching patrons how to efficiently use various information resources. As a result, some academic libraries have introduced information literacy programs, aimed at equipping students and lecturers with information seeking skills using

information technology. In other words, the program is meant to produce independent information seekers and users with adequate knowledge on use of ICTs. All academic libraries in Cameroon are mandated to receive, store, make available, and disseminate research outputs from all its schools and faculties. The Consortium of Cameroon Universities and Research Libraries (COCUREL) have agreed to play a significant role in helping its government in achieving its mission to attain the SDGs and also to propagate and promote information related to them. In partnership with the National Association of Librarians and Documentalists (ABADCAM) and the United Nations Information Centre, Yaounde (UNIC), a series of workshops and conferences have been held on various themes of the SDGs, particularly the contribution of libraries to achieving SDGs. Presentations have been made by consortium members and librarians from the University of Yaounde I to show their mastery of the 17 targets by explaining the expectations and role of the community towards each target. These conferences are aimed at creating awareness on the SDGs calling on students, lecturers, researchers, and the civil society to join the movement towards sustainable development.

The project

With a student population of about 60,000, the University of Yaounde I, is the oldest and most populated in the country, with two faculties, several departments, and Schools affiliated to it. These faculties and schools produce research works related to most of the SDGs. The main library of the University of Yaounde I is the hub of research in its institution. It is not just the depot for physical and electronic research works but an information and knowledge provider for what has been researched and published on a variety of disciplines including those related to the SDGs.

The academic library of the University of Yaounde I has stepped ahead of others in terms of contributing towards the attainment of the SDGs. It has undertaken a cautious and systematic identification, selection, and analysis of publications, theses, and dissertations from one of its schools, the Higher Teachers Training College (ENS) in Yaounde (www.ens.cm). ENS (French acronym Ecole Normale Superieur) is a Higher School of learning that trains Teachers' Trainers of several disciplines. It is attached to the faculty of education. At the end of their two years training, these students produce hundreds of dissertations, publications as end of year projects.

The main library of the University of Yaoundé I has embarked on a project for identification and collection of information resources about SDGs from these dissertations. From some of the titles received in the library, management noticed that a lot of information and knowledge is embedded in research works which can provide in depth knowledge, solutions, and decisions to concerns related to different SDGs. The library decided to start its exploratory mission with one of its schools, the ENS.

How is it done: All hard copies of dissertations are selected and topics classified according to related SDGs, then distributed to library staff that have been schooled on the 17 SDGs. These dissertations are now selected and classified thematically. Each selected dissertation is read critically and if the author has made significant contributions to a particular SDG, it is separated from the bulk for further review and subsequent selection for an eventual entry into a database. Each librarian is assigned to two SDGs. He/she collects a pack of research dissertations, reads each of them, and makes a synthesis of its contents, catalogues, and presents its metadata vis-a-vis the SDG. All dissertations that have made significant contributions to one of the SDGs are jealously preserved for further analysis and eventual posting into a digital repository whose creation will depend on availability of funds.

Advantages of the project vis-a-vis the SDGs and the government

- At the end of the project this collection will be digitized and stored in an institutional repository for the university and it will be Open Access with links sent to relevant communities.
- Major stakeholders like the United Nations Development Programme (UNDP), the World Bank (WB), Food and Agriculture Organisation of the UN (FAO) stakeholders and government ministries dealing with issues and activities related to the SDGs will have a unique portal to access research works related to SDGs.
- Students and researchers will have access to a collection of material on SDGs.
- Researchers will have a reference point for research on SDGs. This will stimulate further research on contemporary related areas.

- An institutional repository will be set up exclusive for the SDGs.

Conclusion

Academic libraries in Cameroon can assist the government to attain emergence and achieve its agenda 2035 by extracting and sharing knowledge through the identification, selection, analysis, creation, storage, and dissemination of research works and publications from its schools and faculties. Even though initiated by the main library of the University of Yaounde I, other academic libraries from public universities and higher schools of learning are willing to emulate if given the resources.

Therefore, it is evident that academic libraries have an indispensable role to play in the attainment of Sustainable Development Goals. They drive the educated and informed nation pillar of SDGs directly because they collect, organize, and disseminate information that society can assess and use to inform themselves on various issues of life referenced in the targets. IFLA (2014) supports the notion that "Access to information is a fundamental human right that can break the cycle of poverty and support sustainable development goals." Academic libraries, therefore, have this critical role to play as individuals should be given access to information without dichotomy and discrimination.
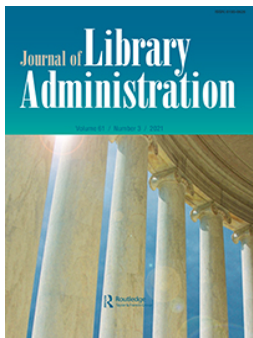
Libraries should aim at hosting events centered on the awareness and implementation of SDGs. Libraries may not know everything about SDGs but offering the library building for conferences, partnering with other libraries, joining library associations and consortia are pivotal in the realization of SDGs.

From the initiative by the academic library of the University of Yaounde I in Cameroon, the need for collaboration with the national consortium for funding, and networking that links all academic libraries in the country to build and manage Institutional Repositories that would help the government, decision makers and parliament to deliver targeted programs.

Finally, academic libraries constitute indispensable agents to achieve Sustainable Development Goals, and there is need for Cameroon to provide academic libraries the necessary support, the status they deserve, and put them on the government agenda.

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A New Lens for Evaluation – Assessing Academic Libraries Using the UN Sustainable Development Goals

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A New Lens for Evaluation – Assessing Academic Libraries Using the UN Sustainable Development Goals

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ABSTRACT
Library evaluation has evolved across the decades to take account of the role of services and collections within their institutions. The framework of the United Nations Sustainable Development Goals (UN SDGs) enables consideration of the value and benefits of libraries within national and international development. Taking this approach, based on the theory of change, provides different insights to the work of libraries. The article provides an overview of library assessment and information on the development of the UN SDGs. Australian academic library activities are assessed using four SDGs to reveal a contribution beyond the walls of their institutions. Methodological comparisons frame a discussion about the nature of value.

Introduction

Academic libraries have spent decades assessing their value through a wide range of methodologies. They have focused on recording the contribution made by their activities to their institutions. The theories behind the methodologies have generally been adopted from economics rather than theories of knowledge. The measures adopted reflect the actual use of the library and its collection, representing a transactional assessment, rather than the potential power of the knowledge and capabilities provided by libraries. More recently social value has been added to the repertoire of assessment, using an economic base.

A new means of assessing and understanding of value has emerged through the framework of the United Nations Sustainable Development Goals (UN SDGs). This methodology reflects concepts of national and international outcomes that create a

sustainable world where knowledge is part of the powerhouse for economic and social transformation. Taking a deeper view at the performance and measurement of libraries through this lens positions our services within a framework based on a theory of change.

In this article an overview of the nature of library assessment is undertaken. The application of the economic and social methodologies is summarized within a sector wide frame to provide a context to establish where and how the UN SDGs could be used. A case study of applying the methodology to Australian academic libraries allows for identification of opportunities the SDGS to highlight the contribution of academic libraries. The evaluation has found that the methodology enables the important role that university libraries play in national and international development and education to be highlighted. The article concludes with a discussion of the implications of using the theory of change to assess academic library performance to create new knowledge regarding the activities of these libraries.

Background

Academic libraries are a vital element of the infrastructure of a modern university, built on centuries of practice and theory. Within the changing environment of academic institutions, libraries have evolved their collections and services to maintain their relevance through grasping opportunities and challenges. Libraries are strongly focused on maintaining their relevance in an increasingly digital world. New forms of learning and pedagogies have affected the services provided to support education. Research in universities is increasingly data driven. Library services have both supported and shaped the new agenda in scholarly communication and education.

Understanding the nature of the 21st century academic library and its contribution to education and research has been a major focus of work within the sector. Other library sectors have assessed how they can provide value to their individual communities. As early as 1994, it was clear that assessing libraries and information needs in research and academic fields was already a vast discipline. For one component of scholarly communication evaluation the literature was extensive:

> There have been hundreds, perhaps thousands, of studies involving scientific and technical information communication performed over the last 25 years. (King & Jones, 1994, p. 2)

It is rare to read a library journal or magazine in recent years that does not include a report on library assessment, whether of libraries in a particular sector or of a particular service, be it resource sharing, research data management, digital library services, or collection building. Library, Information Science & Technology Abstracts (EBSCO, 2020) records more than 11,700 articles on the topic of libraries with the term value. Many thousands more are recorded in Google Scholar.

The changes and intensity of research into libraries and library services evaluations can be seen over at least six decades. The evolution of the methodologies has been significant. Research has developed from recording patterns of use of the collection, a characteristic of the studies in the 1970s (reflected in evaluation texts such as Busha & Harter, 1980) through to economic and social value methodologies in the 1990s. The

increased sophistication of methodologies has a parallel in application of evaluations in institutions in higher education themselves.

For the higher education sector there are highly developed evaluation tools. The international ranking systems produce comparative assessment based on extensive research. The results of each evaluation feature prominently in news, on university websites, and in marketing campaigns. Universities believe that these rankings influence applications from students and increase positive outcomes from applications for research funding. Well established evaluations include the Academic Ranking of World Universities (ShanghaiRanking Consultancy, 2020), The World University Rankings (Times Higher Education, 2020), and QS World University Rankings (Quacquarelli Symonds, 2020). Impact is also assessed in new ways in terms of influencing public policy (Becker and Vanclay 2003).

University and research evaluation has become a fundamental aspect of assessment by governments. In the United Kingdom the Research Excellence Framework reports on the quality of research in UK higher education institutions (UKRI, 2020). In Australia the Excellence in Research Assessment (Australian Research Council, 2019) provides a similar independent evaluation. Many other countries have similar programs.

In an environment where evaluation is a lingua franca for discussions of higher education institutions, it is not surprising that academic libraries are evaluated. Libraries have continued to evolve their assessment activities, applying methodologies from a range of fields to understand the "value proposition".

This article journeys through themes to review the assessment of the value of academic libraries using the economic and social lens that has been fundamental to research in the past decades. Recognizing that the contribution of academic libraries in a modern university goes beyond traditional concepts of research and collection-based services, the application of the theory of change through the United Nations Sustainable Development Goals is used to provide new insights. This approach situates libraries within an international framework and assesses the contribution made to powering the economy and reshaping nations through contemporary activities. This approach encompasses an understanding that society is transformed through the power of research, teaching, and learning. It situates University libraries within a paradigm that understands their role as essential knowledge and information infrastructures which enable student success and research excellence.

Value of academic libraries

In taking an historical view of academic libraries, it is important to note that the libraries have always been a defining feature of universities. Libraries have been recognized both as the keepers and disseminators of knowledge. Histories of libraries identify Middle Eastern university libraries dating back to the ninth century. The House of Wisdom in Bagdad, a university supporting scholarship and the translation of scholarly works has been identified as the initial academic library (Murray, 2009, p. 2). It is not surprising that information about early libraries indicates that their value was in their collection - the number of titles and disciplines represented.

Understanding the value of libraries has been a question considered from many angles. Users/readers has been an important locus - information seeking behavior of students and academics has been the subject of extensive research. Tenopir et al. (2013) had studied reading and library behaviors to understand who is using the collections and in what context – a value in use approach.

Assessing the depth of our collections has seen methodologies rise and fall. From simple measures of numbers of title to sophisticated assessment. The conspectus methodology was one complex and ultimately unsuccessful approach led by the research Libraries Group in the1980s (Stielow and Tibbo (1987) provide a mild rebuke and Munroe and Ver Steeg (2004) report on a lack of adoption and problems).

Emerging from these service and collection level assessments has been a clear need for more holistic assessment. These have developed as libraries have created more complex services. The narratives of libraries have expanded requiring an expanded set of methodologies to assess the nature and delivery of value. Value assessment have been unpacked into many dimensions by a recent report which concluded that the current measurement of value and understanding of theories required considerable action:

> When academic librarians learn about their impact on users, they increase their value by proactively delivering improved services and resources—to students completing their academic work; to faculty preparing publications and proposals; to administrators needing evidence to make decisions. Indeed, the demonstration of value is not about looking valuable; it's about being valuable. (Oakleaf, 2010, p. 140)

In summary, the academic library assessment has evolved to look beyond collections or individual services. The two-key lens, used for meta-level assessment of value of are now "economic and social." Borrowing methodologies from economics has been a feature in the overall environment of management and managerial focus on the financial costs and benefits of libraries.

Studies on the economic benefit of academic libraries have primarily used the concept of return on investment. This frames the evaluation within a financial context that recognizes the significant investment in libraries and the need to assess the nature and extent of the return to the university. This approach aligns with the economic assessments occurring in government and business through the 1990s.

Contingent valuation methodology has been the tool of choice – estimating the value placed on a service or good. It assesses passive use and has been applied to a wide range of libraries in national, state, public, and academic sectors. Studies of the British Library, South Carolina Public Libraries, Florida Public Libraries, St Louis Public Library, Canadian national union catalogue, and New Zealand Te Puna services have found a return on investment of between 2.5 and 35, depending upon the type of service and particular segment of the population served (Missingham, 2005). Compared to these industries, the investment return figures indicate that the benefit is much greater than the investment in the service. A study of university libraries found financial Return on Investment (RoI) of 136%to derive from centrally provided collections provided by the libraries (Outsell Inc, 2009).

Contingent valuation methodology has been criticized as limited and lacking depth.

> We believe that contingent valuation is a deeply flawed methodology for measuring non-use values, one that does not estimate what its proponents claim to be estimating. The absence of direct market parallels affects both the ability to judge the quality of contingent valuation responses and the ability to calibrate responses to have usable numbers. (Diamond & Hausman, 1994 p. 52)

The high variance in results in its application in libraries gives rise to concerns. In terms of providing a true understanding of value, the limitation of assessment to specific services, such as access to a collection or in the case of Canada and New Zealand a shared database, speaks to the methodology providing only partial insight into the benefit of libraries.

A newer body of work has emerged to assess the social impact of libraries including Social Return on Investment (SRI). This methodology has been applied to museums and galleries as well as libraries. SRI is based on collecting and analyzing information about the social value of resources consumed by programs. The methodology is founded on outcomes that are identified by the stakeholders, with data collected through interviews, focus groups, and workshops. Data analysis identifies key themes. The results are both qualitative and quantitative, drawn from a broad interpretation of the theory of change. Built upon program evaluation, theory of change "applies critical thinking to the design, implementation and evaluation of initiatives and programmes intended to support change in their contexts". (Vogel, 2012, p.3)

While these methodologies have been applied in a range of studies, their overall focus means that the results are limited to a particular goods or services. The approach is characterized by conceptual limitations with regards to the value of culture.

> The fact that economic valuation techniques cannot capture the whole of cultural value is well-established amongst many cultural economists … (Crossick & Kaszynska, 2016, p. 138)

Oakleaf (2010) also notes the development of frameworks to attempt to establish social value are limited. She poses questions about the value assessing the transactional activities of the library in improving intra institutional outcomes such as student learning. Insights from the studies are within an organizational framework, owing most to grounded theory and lack assessment of the value or impact of the sector.

Given the limitations of the major assessment tools used so far to establish value, there is a need to continue to review new methodologies. The emergence of the UN SDGs provides an opportunity to view academic library services from a different theoretical and developed methodology.

UN SDGs

The 2030 Agenda for Sustainable Development was agreed by the United Nation's 193-member states on September 25, 2015 in New York. The SDGs replaced the Millennial Development Goals and continued a program designed to lift the quality of life of people across the globe. The historic agreement was negotiated to allow for a program of interconnected activities that would be delivered within individual countries and across countries through programmatic activity.

Figure 1. UN SDGs. (United Nations, 2019).

The 2030 Agenda has 17 Sustainable Development Goals and within these, 169 targets (Figure 1).

Based on the theory of change, the goals were the subject of significant international negotiation. The draft position paper notes that:

> The central hypothesis that underpins the 'theory of change' presented is that in order to effectively support implementation of a transformative, universal, integrated and rights-based 2030 Agenda, and to meet the expectations of Member States, the UN development system must more effectively 'function as a system' in an integrated and coherent manner, at the global, regional and country level.' (United Nations, 2016, p. 1)

The theory combines concepts from environmental, management, and organizational psychology with an underpinning theme of capacity building. Complexity theory (see for example Cairney, 2012; Geyer & Rihani, 2010; Mitchell, 2009), program theory (see Bickman, 1987; Funnell & Rogers, 2011), program evaluation (see Burch, 2016; Shackman, 2020) and psychology (organizational psychology and organizational change) are used to create action focused concepts that will ultimately build economics, social and political systems that will deliver human rights and economic growth (United Nations, 2017). Weiss, a member of the Aspen Institute Roundtable that facilitated the development of the theory of change, notes that the approach requires clarification of long-term goals as a necessary precondition to engage stakeholders in complex community initiatives (Weiss, 1995). Briant (2015) traces the origin of the goals to Keynesian economics where state regulatory agencies (which must include in the case of the SDGs operational agencies) adopt a neoliberal economic approach to archive national benefits within an international system that requires economically democratic processes.

Libraries are a key element in the economic, social, and educational structure within nations. They deliver public, educational, health, and state services that enhance community well-being and economic outcomes. Expanding the understanding of the value of libraries through exploring the SDGS had become a significant activity by the library sector.

International Federation of Library Associations (IFLA) Secretary General Gerald Leitner has commented:

> I am convinced that there is a space for libraries in the world envisioned by the UN 2030 Agenda. Not just that there can be a space, but that there must be. We cannot achieve the SDGs without libraries. (IFLA, 2019, p. 1)

The Development and Access to Information report (International Federation of Library Associations and Technology & Social Change Group University of Washington Information School, 2019) focused on the need to approach an understanding of the value of libraries from the point of view of meaningful access. They identify the SDGs as the first framework that fully recognizes the potential of libraries and information to achieve transformation in civic, social, and economic activities across the world.

A review of Australian University libraries using the SDG framework (Missingham, 2019) provides an opportunity to assess the relevance of the approach to academic universities and consider value within a new light.

Case study: Australian university libraries

In Australia, university libraries provide services that are essential for education, research, and the full range of scholarly communication activities. There are 39 Australian university libraries supporting the education of 1.5 million students in 2017, and the research and teaching undertaken by over 1,20,000 full-time equivalent staff.

University education is a very significant component of the Australian economy, the third largest industry which added an estimated $140 billion to the Australian economy in 2014 (Deloitte Access Economics, 2015).

Academic libraries support the SDGs through a wide range of activities including:

- Promoting literacy, including digital, media and information literacy, and skills, with the support of dedicated staff.
- Closing gaps in access to information and helping individuals in all aspects of their life understand information needs better.
- Providing a network of delivery sites for government programs and services.
- Communicating knowledge created in our universities.
- Serving as the heart of the research and academic community.
- Building global partnerships and collaborations that provide greater access to digital collections and information capability programs.
- Preserving and providing access to the world's culture and heritage.

In relation to the SDGs, four emerge as highly relevant to the academic library sector– quality education (Goal 4), gender and equity (Goal 5), industry innovation and infrastructure (Goal 9), and sustainable cities and communities (Goal 11). The goals were chosen because they are directly linked to education and the equity of access to education. While other SDGS such as inequities are relevant this subset provides the opportunity to testing measures in a clear manner.

An assessment of national achievement against these goals identifies values that have not previously been expressed through economic and social analysis. Data from the

Council of Australian University Libraries report (Missingham, 2019) and updated information gives a range of insights below.

Goal 4: Quality education

Australian academic libraries provide support for education that results in informed citizens who contribute through activities around the globe. Innovation in service and education underpins library practice, fostering outcomes of student capabilities, and educational practices.

Students and academics significantly benefit from services provided – in 2017 (Council of Australian University Libraries, 2018):

- 47,748,189 users visited university libraries.
- 8,056,573 books were borrowed.
- more than 214 million uses of electronic resources occurred.
- 955,218 enquires from students and academics were answered – providing a transfer of knowledge building capabilities for the future.
- 481,381 members of Australian universities attended information literacy training sessions that build skills as diverse as searching, writing, data management, and using technologies.
- 21,127 group sessions were held to engage with the academic community and those outside the university to build knowledge.

The power of knowledge developed through university libraries is transforming individuals, families, communities, and nations.

Patrons occupied 92,857 seats and were provided with services 24 h of every day through access to information resources and physical library spaces.

These activities change lives – the outcomes can be seen in the contribution students made through their work in industry, educational institutions, government, societies, families, and local communities through their careers.

The footprint of universities is expanded through activities such as through exhibitions and public events, connecting the community and visitors to the knowledge of the world, thus increasing knowledge to enhance economic potential.

Innovation in affordable access to text books has been achieved at Western Sydney University through the Accessible text books project (Western Sydney University, 2019). The University recognized that for many the cost of textbooks is prohibitive, particularly those with social and economic disadvantages. The initiative reaches across disadvantages to provide all students enrolled in first-year subjects with free digital textbooks, established in 2017, the initiative continues.

The University was the first in Australia to provide free digital textbooks for its students. Western's ground-breaking initiative is one of the world's largest provisions of free textbooks for commencing students. With the average cost of a textbook being $100 per book, our commencing students receive up to $800 worth of value. The library undertakes a key role in establishing and enabling the initiative which transforms access to information and education for the students. Rather than

carrying bulky textbooks, students have easy access to fully searchable digital textbooks, with the ability to highlight and mark notes on-screen for future reference. For students with a disability, the books are completely accessible to screen readers and other support tools. This program is in direct response to student feedback indicating that covering the cost of purchasing textbooks was one of the biggest financial hurdles when starting university.

Goal 5: Gender and equity

Libraries support gender equality by providing safe meeting spaces, programs for women and girls on rights and health, and ICT and literacy programs supporting women to build their entrepreneurial skills.

University libraries have in particularly developed support programs that have been integral to the response of universities to addressing the findings of the Human Rights Commission study into sexual violence and sexual harassment in universities.

Library initiatives have included developing staff knowledge in preventing and supporting situations of sexual harassment, use of libraries as safe spaces, and information activities conducted through library services such a drop in sessions.

Library employment has also been an area of initiatives in equity and diversity. Libraries have adopted the Aboriginal and Torres Strait Islander Protocols for Libraries, and Archives and Information Services first published in 1995 by the Australian Library and Information Association. The Protocols were most recently updated in 2012 and endorsed by the Aboriginal and Torres Strait Islander Libraryand Information and Resource Network.

The Protocols are intended to guide library and information practitioners in the provision of appropriate services and management of resources about Aboriginal and Torres Strait Islander peoples and cultures. The Protocols offer a path to reconciliation, a guide to culturally appropriately managing collections and services. Broad in scope and principle based they cover governance and management, content and perspectives, intellectual property, accessibility and use, description and classification, secret and sacred materials, staffing, developing professional practice, awareness of Aboriginal and Torres Strait Islander peoples and issues, copying and repatriation of records, and the digital environment (Aboriginal and Torres Strait Islander Library, Information and Resource Network, 2012).

An initiative that reflects the valuable contribution of libraries is the partnership of Charles Darwin University Library with researchers to sustain and preserve Aboriginal languages and culture (Godfrey et al., 2016). The Library has contributed to the Living Archive of Aboriginal Languages by assisting in building a repository, web application and digitization program to preserve endangered Indigenous resources and facilitate both Indigenous community engagement and international linguistic research. The project serves as a rich case study demonstrating how academic libraries can work with researchers to support the archiving of cultural heritage. A key contribution to the project was the Library's expertise in knowledge and resource organization and its management in relation to creating, storing, preserving, and sharing the type of materials included in the Living Archive. Furthermore, the Library played a crucial role in the

establishment of the Archive by providing ongoing technical information management support needed to ensure its success and sustainability. The Library hosts the Archive in its institutional repository.

Goal 9: Industry, innovation, and infrastructure

Australian University Libraries support industry and infrastructure through a range of initiatives including the Government's National Collaborative Research Infrastructure Strategy (NCRIS). A major initiative of university libraries has been developing research data capabilities and access to this data. Australian university libraries have developed services that (2017 data; Council of Australian University Libraries, 2018):

- provide access to 569,927 openly accessible research outputs.
- resulted in 30,651,406 downloads.

In addition, university research is communicated by publishing. One in four university libraries in Australia is publishing original scholarly works in some form (mostly journals), with most available online and are open access.

An example of achievement of publication and dissemination of scholarly works is the Australian National University (ANU) Press, which sits within the ANU Library. At the end of 2019, the Press had published more than 880 titles – all of which are available via open access. The reach of the ANU Press is significant — 4,662,755 downloads in 2019. Highly influential works reach all corners of the globe, particularly developing nations, in a way that print books could never have achieved. Prof Adam Shoemaker's award-winning book "Black words white page: Aboriginal literature 1929–1988" has been for almost a decadence been one of the top read works. It has influenced thinkers and researchers in nations as diverse as South Africa and India. If the work were in print there would not have been a copy in a library in either continent – the open access digital publication enables scholarship to have impact and contribute to innovation and learning around the world. In addition, a new textbook series is dramatically opening-up education materials to all across the world.

Goal 11: Sustainable cities and communities

University libraries support their communities and cities through removing barriers to information.

- Libraries offer members of the community access to their collections through opening their doors to visitors.
- Access to information and collections is enhanced through online and physical exhibitions and public lectures.
- Online digital literacy resources and training is made available freely to increase the knowledge and skills of the community.

The documentary history of the nation and the world is held in libraries. University library activities include:

- Digitization programs that are increasing access to these important resources.
- Sharing of these resources through national and international databases such as Trove and WorldCat.
- Work with national, state, and public libraries to develop greater digital access.

Libraries deliver programs that make Australian research available to the world. Our open repositories enable research to be available overcoming paywalls and expensive subscriptions (Council of Australian University Libraries, 2018).

- 569,927 accessible research outputs including conference papers, journal articles, book chapters, and other research papers are made available openly.
- 63,883,120 accesses occurred to research outputs in 2017.

Australian universities support communities through making theses accessible. These are the result of extraordinarily deep research often unearthing discoveries that will change the way we live, work, and understand the world. Theses in this case refers to the products of doctoral research and masters by research.

In 2017, libraries achieved access to over 2,75,000 theses of which more than 95% were available openly. The theses were used by others in more than 190 countries around the world.

At the Australian National University more than 83% of the individuals who benefited from accessing the research came from other countries. There was an average of over 78 downloads per thesis – with barriers to access overcome for the researchers and those who were able to use the outcomes of the research. An example is research into Timor Leste that is being used to reshape the agenda of non-government organizations in addressing ways to deal with violence.

In Tasmania, the City of Launceston's Queen Victoria Museum and Art Gallery, University of Tasmania, State Government bodies Libraries Tasmania (including the Tasmanian Archives and State Library), and the Tasmanian Museum and Art Gallery are working together on the Digitized Cultural Experience sub project of the Greater Launceston Transformation – Creating our Digital Future Project funded by the Australian Government (Department of Infrastructure, Regional Development and Cities, Australia Government, 2019). This project will digitize and make discoverable the substantial cultural assets from Launceston and the region. The project will cumulate in development of two extended reality products for education and tourism.

The spirit of cooperation has resulted in a unique partnership, bringing together cultural institutions, local and state governments, and higher education to share technology, expertise, and knowledge to showcase Tasmania's significant historical and cultural assets. By working together, the discovery and sharing of Tasmania's treasures is delivered benefiting artists, remote communities, researchers, industry, tourists, and schools.

Table 1. Library assessment frameworks – assessment of dimensions.

Framework	Economic (contingent valuation/ROI)	SRI	Value in use	SDG
Economic aspects	Y	Y	Y	Y
Library strategy	N	Y	N	Y
Impact measure	N	N	N	N
Holistic patron perspective	N	N	N	Y
Social benefit measurement	N	Y	N	Y
Community impact measure	N	Y	N	N
University sector wide measure	N	N	N	Y
Collaboration measure	N	N	N	Y

Findings

From the application of the SDG framework to Australian University libraries, it is clear that qualitative and quantitative measures can be integrated to provide insights into the value provided by academic libraries to the communities within their institution, city, and regional communities and national impact.

The SDG framework was explored to understand the assessment of value to a level of complexity not available through other more widely applied methodologies. When the results are compared to that of economic (contingent valuation/ROI), SRI, and value in use (size and use of collection and information use studies) there are considerable differences. Assessing the major differences, the four methodologies fill particular aspects of reporting (Table 1).

Assessed by the author against these criteria, the SDG framework provides a multi-dimensional assessment not available from the other methodologies. The other methodologies have different strengths and weaknesses. Much of the difference stems from the theoretical base of the approaches. SRI and the SDGs are based on theory of change and thus have more in common that the other methodologies. Value in use comes from library ad information science while economic ROI comes from economics.

Comparing the methodologies enables consideration of the applicability of each system to different reporting and stakeholder information needs. Evaluation must be contextual to organizational situations.

Limitations

Evaluating alignment through the UN SDGS is increasingly a topic in scholarly communication and publishing. While this article is limited to the role of libraries, publishers are increasingly opting to commit to the SDGs and assessment their publishing against the goals. The recently introduced SDG Publishers Compact (United Nations, 2020) reflects adoption by major publishers of the need to ensure that research is published and available to support the goals. SpringerNature (2020) provides an example of the depth of evaluation of research using the SDGs. Understanding the broader impact in terms of dissemination of research will require the added dimension of publisher activities.

Conclusion

Academic libraries have explored evaluation methodologies for many decades. The major activity has been in the application of theories and tools borrowed from other disciplines such as economics and management. Studies from library and information science theory have focused on users (significantly information behavior). This work has formed individual reports that have sought to establish numeric indicators, consistent with the environment of university evaluation.

Understanding the value of library services is, however, a complex interplay of latent value (such as collections), research services (including data management), educational support services, and activities in the realm of scholarly communication.

Blending the qualitative and quantitative indicators to provide holistic reporting has been an aspiration not yet realized. Malapela and De Jager have suggested:

> The concept of valuing a library service has concerned library and information professionals for more than three decades, there has however been little consensus on the best approaches to determine and measure the value of library services. (Malapela & De Jager, 2018, p. 276)

Situating the value of libraries within a complex system framework with the UN SDGs provides an opportunity to reflect on value that is experienced by multiple communities – library patrons, their institutions, the cities, and regions they are within, the nation and indeed to world (particularly in terms of reach in dissemination of their university's publications and data). Such an approach provides new insights that identify the richness of activities and innovations of academic libraries.

Recent developments in the SDGS have identified new levels of reporting. These measures are focused on government and industry and as yet have little relevance to libraries, despite the best efforts of library associations to reinterpret them (for example Australian Library and Information Association, 2019; American Library Association, 2020).

The case study of Australian academic libraries establishes that the SDGs can be used as a reporting framework despite the lack of specific library measures. From the case study, it is clear that academic libraries provide a value to their stakeholders which goes beyond numeric measures of economic and social benefit. The values observed align to the critical roles of a modern university – of education, research, and national impact. The nature of the diverse benefits reflects the three levels of individual library, institution, and national benefits.

There is opportunity to rethink the identification of value of libraries and their associations to establish how the sector, and indeed the combined infrastructure of academic libraries, produce values in new and different ways as library practice evolves. There is also an opportunity to meet the challenge of understanding value by applying the theory of change and complexity theory that underpin the SDGs.

Consideration of the SDGs also raises the issue of how the assessments can be used to influence or create new objectives and activities for the sector. Establishing areas for change including commitments for governance for change requires a new approach to decision making (for governance aspects see Kemp et al., 2005).

Implications and future research

This article has outlined the opportunities to understand value from different theoretical approaches and methodologies. It has tested the application of SDGs to tell the story of the unique contribution that libraries make to higher education and their nations. It finds that the dimensions offered through the SDG framework fill a gap in library assessment. National and international impact have previously been generally assessed in terms of research outputs for the higher education sector rather than library services. The case study of Australian libraries provides a springboard for international comparisons in the future.

For Library administrators this article provides an example of how their libraries contribution can be presented using the four main goals most relevant to higher education libraries in a manner that both uses existing indicators and stories that describe impact. The methodology draws together traditional statistical information in a new way that provides an institutional, national, and international contest for their work.

Further work could be undertaken to enable analysis of the application of methodology to reshape governance and program delivery in academic libraries. The research could also provide comparative information between nations, potentially mapping to national reporting against plans for implementation of the SDGs.

Future research could also look at the nature of the role of libraries and publishers in making knowledge available to support the SDGS. The new compact between publishers and the UN around the SDGs in 2020 suggest that analysis and data will be available in the future to analyze the contribution of both these parts of the scholarly information ecosystem.
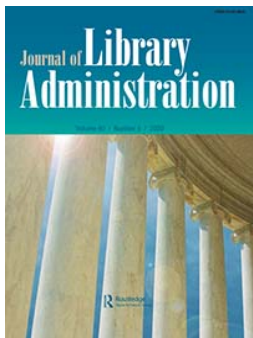
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Pandemic Impacts on Library Consortia and Their Sustainability

George Machovec

Routledge
Taylor & Francis Group

LIBRARY NETWORKING AND CONSORTIA

Check for updates

George Machovec, Executive Director, Colorado Alliance of Research Libraries, Denver, CO, USA

COLUMN EDITOR'S NOTE

This column focuses on formal collaboration and networking among libraries through consortia. It offers in-depth examinations of issues facing modern library consortia including (but not limited to) e-resource licensing, ebooks, next generation integrated library systems, shared print programs, resource sharing, shared digital repositories, governance, planning, open educational resources, affordable learning and other relevant topics to library consortia. Contributions are accepted for this column and must be submitted to George Machovec at george@coalliance.org. Contact the column editor for suggested topics, deadlines and formatting.

Pandemic Impacts on Library Consortia and Their Sustainability

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ABSTRACT

Library consortia are planning on how their funding, programs, and services may need to change with the societal tumult caused by the 2020 Covid-19 pandemic. Most consortia in North America are either state agencies or non-profit corporations which may have different approaches and options available for solving substantial budget shortfalls. Changes may need to take place in staffing, programs, and services. Some consortia may have financial portfolios which may help on filling-in budget holes. Other consortia have applied for, and received, funds from the Paycheck Protection Program (PPP) to help with staffing. Many library consortia will not see a quick recovery but may have long-term consequences as their member libraries and parent organizations try to recover.

Introduction

The 2020 COVID-19 pandemic has significantly altered the ways that libraries, consortia, publishers, and vendors provide services to their customers. By mid-March 2020 virtually every library in North America had closed their doors albeit some were offering limited services such as document scanning, resource sharing for interlibrary loans, course reserves, and other limited services. By March 17th, the situation had become so dire that even the American Library Association recommended that libraries close their services to the public for all library types (https://americanlibrariesmagazine.org/blogs/the-scoop/ala-executive-board-recommends-closing-libraries-to-public/). As an obvious

result, many library organizations and consortia have largely ceased in-person operations with staff working at home to support their member libraries in whatever way possible.

As with the rest of society, reduced finances will significantly impact most libraries as their parent universities, colleges, municipalities, and other organizations experience the financial downturn. Tax revenues are significantly lowered, out-of-state students (including international students) will cause a significant reduction in revenue, and tax-based funding of libraries of all types will decline. The domino effects of this reduction will cascade to library consortia with major impacts happening in the new fiscal year. Although some Federal stimulus may help some states and universities, it is unclear how much, if any, of these funds will trickle to support library services.

Licensing

Library consortia come in many different flavors with some being municipal or state agencies while others are independent not-for-profit organizations that are funding by their members. The licensing of e-resources is one of the most common activities performed by consortia since libraries will typically get lower prices or improved access by banding with others in working with vendors or publishers. Improved terms and conditions coupled with greater market influence are also factors, but lower prices are the primary driver.

Some consortia fund a part or a majority of their operational expenses by skimming an administrative fee or a percentage from each collaborative deal they broker. The advantage to libraries is clear, work with others to get a substantially better price aided by expert negotiators and pay a modest overhead to support the activity. However, if libraries are forced to cut back on databases, journal packages, ebook packages, and other subscription services; the number of deals that are negotiated and processed through consortia will decline thus lowering their revenue. If this level of decline is substantial it could severely hurt consortia staffing and sustainability.

Even for consortia that are not funded through a licensing operation, the impacts could be substantial. For many library consortia, the return on investment (ROI) for their services is often based on how much licensing is done. If this falls, the cost-benefit for a membership assessment (or state funding) may be put in question which is problematic as the most experienced staff cannot easily be replaced by lower cost or part-time help.

Vendors and publishers will likely see a dramatic drop in revenue, right at the time when libraries are asking for discounts or special consideration. Consortia will likely be licensing fewer resources as available funding declines along with their member libraries.

The International Coalition of Library Consortia (ICOLC) has made a formal statement regarding the current COVID-19 downturn (see Appendix) which has now been translated into over 10 languages indicating the international nature of the crisis. (https://icolc.net/). Some of the recommendations include removing a paywall in front of all research related to the pandemic including removal of restrictions on copyright or resource sharing to aid the international research and health-care community. The statement also recognizes the long-term impact of funding with requests for flexibility in timing in payments, reducing

or stopping price increases on subscription services, and working with customers on access and authentication if technical institutional issues are encountered.

Another collaborative effort being spearheaded by ICOLC has been the compilation of special offers by vendors and publishers during the pandemic (https://docs.google.com/spreadsheets/d/1pFSA-yEDixl5ZKtQmEUOuW_vdDFLdzDbhjP5Cjrkajo/edit#gid=0). Although many of the offers are short term, they do represent a good faith effort by the commercial community to help improve access during the time of need. Some of these may translate into future business as libraries take short term advantage of broadened access. The strength of building a list by the community is that every consortium and library are getting different communications based on their existing relationships. Seeing a more complete list informs the entire library community of a broader range of offers.

Of course, if libraries have substantial long-term drops in funding, cancelations will take place with impacts on both users and the vendor community. In those cases, libraries may want to work with publishers and vendors to see if arrangements can be made with the new reality.

Resource sharing

Resource sharing has a long history with libraries in both the print and digital age. Many of these activities have been substantially curtailed due to limited staffing, technology, and the closure of facilities used to support activities.

Traditional interlibrary loan for books and other physical items have been substantially curtailed. Part of the reason for the drop-in service is that libraries are closed and cannot pull materials for delivery. Even if a library does keep a skeleton crew in their buildings, arrangements would need to be made to get materials to patrons through some type of curbside pick-up or mailing materials to customers each of which has its own challenges.

Regional union catalogs and delivery services often rely on courier services for cost-effective delivery of materials at scale. With many of these courier systems also shut down the delivery cannot be made. Also, the cost of moving this delivery to the next least expensive service (usually the United States Postal Service) is often a huge increase in price due to both the cost of shipping and packaging. As an example, the library courier service in Colorado which is operated by CLiC (Colorado Library Consortium) can deliver a book for about $0.50 but the cost to do it through USPS would be five times more expensive not even counting the packaging costs (most courier services have reusable bags and totes for deliveries). The scope of this becomes apparent when one looks at the volume. For example, the Prospector system (https://prospectorhome.coalliance.org) delivered about 500,000 items in 2019 to about 50 libraries in its union catalog.

There is also some fear about how long the Covid virus may stay in books and other printed materials. The U.S. Center for Disease Control (CDC) has provided some guidance on how libraries, museum, and archives can mitigate the COVID-19 virus for paper-based and other types of collections. (https://www.imls.gov/webinars/mitigating-covid-19-when-managing-paper-based-circulating-and-other-types-collections). The Institute of Museum

and Library Services (IMLS) has provided helpful information to libraries as needs and concerns abound. (https://www.imls.gov/coronavirus-covid-19-updates).

The pandemic has made libraries and their patrons even more aware of the value of ebooks and other digital resources. Access to these resources has remained open and a lifesaver for many scholars, students, others. Academic libraries have long been directing most of their spending to e-resources and some are strategically thinking of adding digital packages to augment their print collections. For example, both EBSCO and ProQuest have academic ebook packages that some universities have not licensed due to overlap with their legacy print materials. However, these types of collections have a relatively low unit cost and would be a quick way to expand access as long as the physical materials are not accessible.

One of the other areas that the pandemic highlights is the need for publishers to loosen resource sharing permissions for their ebook collections. Historically, most ebook packages are locked-down by contract and cannot be shared outside of their direct patrons. For the last few years, libraries have become more insistent that packages have some reasonable whole-book interlibrary loan rights as has been long done with printed materials. The need for this is clear, particularly with smaller institutions, since they will never be able to acquire even a small fraction of what is needed. With ebooks locked-down by contract, there is no way to share materials. Some publishers are moving in the right direction but usually only if a library or consortium has a direct contract with them. This provision should also be expanded to ebook aggregators, particularly for DRM free titles, to support current and future needs.

Budgets and sustainability of library consortia

Library consortia are each unique in that they have different programs and services as well as varying funding models and administrative structures. The current pandemic and concomitant downturn in the economy will affect them in different ways. Some of these variations are due to different library types, regions of the country, and how parent institutions fund library services in the downturn.

As part of the $2+ trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act, $50 million has been allocated for libraries to be administered by the Institute of Museum and Library Services (IMLS). "The emergency investment allocated to IMLS will enable libraries and museums to prevent, prepare for, and respond to coronavirus, including by expanding digital network access, purchasing Internet access devices, and providing technical support services to their communities." (https://www.imls.gov/news/federal-government-invests-50m-museums-libraries-address-digital-divide-during-covid-19). This funding will certainly help libraries over the course of the next year but will likely not aid operating budgets for the long term. The need is certainly much greater than this welcome funding can support and will augment what can be done with otherwise reduced budgets. Some library consortia have also been able to apply for the Paycheck Protection Program (PPP) that was instituted by the CARES Act. If successful and these consortia can maintain their staff on payroll, they will receive a few months of payroll which will not have to be paid back. This will be especially helpful since the

financial shortcomings for most consortia will come in the next budget cycle and saving money now may help in the future.

Not-for-profit library consortia often have some type of library assessment or fee for membership and possibly other fees for specific programs and services. If libraries are unable to pay their annual membership fees what will be the impact? Some have reserve funds that could help augment the shortfall but using it may hurt long-term residual income and would substantially weaken the safety net. Another option, for some, would be to reduce a portion of their membership or service fees with the possibility of paying it back over the long term at zero or low interest after the crisis subsides. These types of arrangements may vary depending on whether an institution can even participate in such a program whether formal or informal.

Another fear with consortial budgets is that revenue also comes from specific programs and services. If libraries cannot afford to participate in such programs, or perhaps at a reduced level, will that service be able to continue in its current form. As an example, if a resource sharing service loses participating libraries the overall value declines for everyone. In addition, there may be fixed costs for staffing, infrastructure, or software licensing. If there are too many members dropping out the entire system could collapse.

Consortia that have a heavy dependence on administrative surcharges for group licensing will likely see a drop in revenue as libraries need to drop products in a budget shortfall. The level of impact will depend on timing and how these contracts are constructed. It is not a good time to change financial models since all areas are under financial stress but creativity and flexibility will certainly help.

Some consortia are state agencies and receive their money directly from the state legislatures to support operations and services. Since all states and municipalities are experiencing drastic shortfalls in revenue due to reduced tax revenue this will cascade to library services. Some libraries will have to furlough or reduce its workforce, have a smaller materials budget, and perhaps even close branches or shorten hours. Reduced operating and materials budgets will likely impact consortial memberships although if the consortium has a strong cost-benefit proposition, staying engaged with the community may be one of the best approaches for maintaining services.

Libraries have a long tradition of collaboration and library consortia exist because they provide value to their members. If consortia can adapt and survive the current crisis, they may be better positioned as other challenges arise.

Appendix

Statement on the global COVID-19 pandemic and its impact on library services and resources

Issue Date: March 13, 2020
Statement
This statement, written on behalf of the many library consortia across the world that participate in ICOLC (International Coalition of Library Consortia), and the individual libraries these consortia represent, has two purposes. It is intended to help publishers and other content providers from whom we license electronic information resources and purchase printed content (hereafter simply referred to as publishers) understand better how the current global COVID-19

pandemic affects the worldwide information community. Its second purpose is to suggest a range of approaches that we believe are in the mutual best interest of libraries and the providers of information services.

The ICOLC participating consortia consider the current crisis of such significance that we cannot simply assume that libraries and publishers share a common perspective about the magnitude of the crisis and the best approaches to cope with it. ICOLC members have been exchanging perspectives about how the global COVID-19 pandemic will impact consortia and their member libraries.

At this time according to UNESCO, partial or complete university and school closures in 49 countries have canceled or suspended classes for 391 million students.

Many college and university students will be completing the current academic term in an entirely online format, so the campus communities can practice social distancing as recommended by the World Health Organization and many other national and global health agencies.

We ask that Publishers immediately consider:

1. **Making any relevant content and data sets about COVID-19, Coronaviruses (regardless of species affected), vaccines, antiviral drugs, etc. currently behind subscription-only paywalls Open Access immediately** to facilitate research, guide community public health response, and accelerate the discovery of treatment options.
2. **Removing and waiving all simultaneous user limits** to an institution's licensed digital content during this period when universities are going all online in order to allow research, discovery, and learning to proceed.
3. **Lifting existing contractual ILL restrictions or photocopying limits** temporarily so that libraries may assist our students to complete their term.
4. **Allowing the maximum extent of copyright limitations, exception and fair use, even if contractually restricted,** to enable institutions to continue their vital teaching missions as campuses transition to an online, remote format.

We ask that publishers begin planning to:

5. **Allow flexible renewal periods and lengthened payment due dates** as we do not know the future impacts on health or business operations for either consortium staff who facilitate the renewal, or for the librarians at our member institutions. If the regular renewal cycle is disrupted, we ask that **publishers keep access on for our member libraries,** even though the consortium's or institution's current agreement may have expired.
6. **Delay or minimize any planned price increases** until the upheaval and disruption that we are seeing in our user communities, public health systems, and stock markets all over the world calms. The financial impacts on institutions of higher education and the global economy are as yet unknown, and price increases will add even more pressure to already-stressed universities and municipalities. In stable times, standardized pricing and terms may work relatively well. But today, libraries will be under heavy pressure to divert financial resources to other areas of immediate concern within the institution or local government.
7. **Develop plans to temporarily lift paywalls or develop alternative methods of authentication** to allow access to subscribed content if traditional campus authentication mechanisms (VPNs, proxy servers) are overloaded under the increased traffic.
8. **Lift campus-only restrictions,** so that teaching activities can continue online and remotely, despite University closures.

We encourage publishers to work together with consortia and libraries for the benefit of all communities. Library consortia are uniquely positioned to be the most effective and efficient means to preserve the customer base for publishers and create solutions that provide the greatest good for the greatest number.

It is in the best interest of both publishers and consortia to seek creative solutions that allow critical access to publisher content for the research and public health communities.

In combination, we suggest these approaches as a way to advance the conversations among libraries, consortia, and publishers, who all hope to provide as much information as possible to the users who need it. We believe our recommendations provide a solid foundation for the information community, including the publishers of scholarly information, to go forward together in these difficult times.

Contact Persons:
ICOLC Coordinating Committee Members:

- Rick Burke, Chair (2018–2021), Statewide California Electronic Library Consortium | SCELC | USA
- Anita Cocchia (2019–2022), British Columbia Electronic Library Network | BC ELN | Canada
- Teri Gallaway (2018–2021), The Louisiana Library Network | LOUIS | USA
- Lucy Harrison (2019–2022), GeorgiA LIbrary LEarning Online | GALILEO | USA
- George Machovec (2017–2020), Colorado Alliance of Research Libraries | Colorado Alliance | USA
- Sandrine Malotaux (2018–2020), Consortium unifié des établissements universitaires et de recherche pour l'accès aux publications numériques | Couperin | France
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- Pim Slot (2020–2022), SURFmarket | UKB | The Netherlands
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Promoting Sustainable Development Goal 4: The Role of Academic Libraries in Ghana

Lilian Atta-Obeng & Perpetua S. Dadzie

Routledge
Taylor & Francis Group

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Promoting Sustainable Development Goal 4: The Role of Academic Libraries in Ghana

Lilian Atta-Obeng[a] (iD) and Perpetua S. Dadzie[b]

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ABSTRACT

This study, in view of the global importance of the Sustainable Development Goals and the current under-development of public library services in Ghana, aims to examine the role of academic libraries in promoting knowledge and skills for lifelong learning opportunities among students in Ghana. The research population comprised three (3) Heads and three (3) Deputy Librarians of selected academic institutions. Participants were identified using purposive sampling technique. Data were collected using one-on-one interview, non-participatory observation and documentary evidence. The study has identified some fundamental issues in relation to lifelong learning. The findings support the fact that academic institutions contribute significantly to lifelong learning by providing access to relevant information, giving trainings on research publications, as well as search strategy training, communication skills training, information literacy, and reading. This paper provides insights for academic librarians and decision makers in disseminating measures for the promotion of knowledge and skills for lifelong learning opportunities among students in Ghana. The study recommends some relevant strategies such as collaboration of academic libraries and educational associations.

Introduction and background to the study

The Sustainable Development Goal (SDG) 4.7 enjoins us to ensure that by 2030, all learners acquire the knowledge and skills needed to promote lifelong learning (United Nations, 2016). Lifelong learning is defined generally as a continuous development throughout the life of an individual, where initial acquisition of knowledge and skills is assessed and upgraded consistently, to meet the challenges set by an ever-changing society (Brophy, Biswas, Katzlberger, Bransford, & Schwartz, 2000). The introduction of new information-based work tools, therefore, requires individuals to increasingly develop new skills or advance their already acquired skills to access information.

On January 1, 2016, 17 Sustainable Development Goals (SDGs) replaced the previous 8 Millennium Development Goals (MDGs), with 169 targets (United Nations, 2016). According to Vandemoortele (2011), "the question is not whether to abandon global targets, but rather how to improve the MDGs architecture and how to adjust them to the priorities beyond 2015".

Several studies have been conducted by researchers into knowledge and skills for lifelong learning opportunities (e.g., Balagué, Düren, & Saarti, 2016; Huang, Newman, & Schwartzstein, 2014; Koloniari & Fassoulis, 2017; Moreno-Romero & Carrasco-Gallego, 2012; Sidorko & Yang, 2011; Zadra, 2014). In fact, it has been the interest of most scholars to research into areas such as knowledge management and lifelong learning, however, most of these studies focused on perception of knowledge management while others focused on knowledge exchange and community engagement. Moreover, majority of most of research studies focused on lifelong learning in public and school libraries (e.g. Agee, 2005; Ashcroft, Farrow, & Watts, 2007; Hare & McLeod, 2001; Todd & Tedd, 2000; Wijetunge, 2000). Forsyth (2005) expansively discussed the contribution of public libraries in the achievement of the eight United Nations Millennium

Development Goals, highlighting the importance of libraries to community development. In the view of Radijeng (2013), attention over the years concentrates on how public libraries can drive a nation to attain development. Much is not written on the role academic libraries play with regard to lifelong learning, especially in developing countries. In Ghana today, almost all public universities are situated across 16 regions either conducting regular sessions or distance education. These public academic institutions absorb majority of the population and provide free Internet facilities to their students to teach them ways to learn one expertise or the other which could be applied in the workplace after school. On the other hand, public libraries are underfunded and due to their insufficient staff and poorly equipped facilities, the nation is at a disadvantage with regard to realizing the SDG 4: target 4.7. For instance, in 2017, the public library framework in Ghana had human resource constraints of just 12 expert staff overseeing 10 regional and 53 local libraries (Satsi, 2017). Academic libraries, on the other hand, are viewed as the best among the libraries in Ghana, with to regard other structures, proficient staff, good ICT infrastructure, increased and improved collections of hardware, among others. This study investigates how academic libraries can fill the void in order to achieve SDG 4.7.

Academic libraries support learning, teaching, and research needs of their users by providing learning resources, which contribute to the creation of multiskilled learners who are able to think critically, pose and solve problems, and become independent lifelong learners (Malan, 2007). In addition to the traditional role of gathering, processing, disseminating, storing, and providing information services to the university community, academic libraries in this digital and knowledge age have repositioned themselves to promote the learning of generic skills such as effective communication and interpersonal skills, critical thinking, problem solving, and cooperation or teamwork (Nonthacumjane, 2011, p. 283). Academic libraries assist students' learning as well as serve as a central place for students to develop their information competencies by providing them with various opportunities to learn with information.

Learning is a lifelong process, and new factors have arisen, which require librarians and information professionals to transfer knowledge to their patrons to.

This study thus investigates how three academic libraries in Ghana are promoting knowledge and skills for lifelong learning opportunities as a means to achieving the Agenda 2030 for sustainable development.

Statement of the problem

Development of new skills is necessary to access new ways of learning, thinking, working, and living, as well as manipulate or handle new information-based work tools effectively. Malan (2007) indicated that the role academic libraries play in providing learning resources contributes to the creation of multiskilled learners, who are able to think critically, pose and solve problems, and become independent lifelong learners.

Notwithstanding the benefits of such generic skills, a personal interaction with some academic librarians indicated some challenges. These challenges frustrated them in their quest to providing students with learning resources which would in turn enable them to become lifelong learners. For example, the institutional statutory focus was not on developing lifelong learning facilities. As a result, some of them offer assistance on search strategies only based on request, while others have limited computers and smaller training rooms for teaching information literacy skills. This is the problem that confronts the selected academic libraries of this study in playing effective roles in the promotion of knowledge and skills for lifelong learning.

Purpose of the study

The purpose of the study is to investigate the role academic libraries play in promoting knowledge and skills for lifelong learning opportunities in some selected academic institutions in Ghana, as a means to achieving the Agenda 2030 for sustainable development.

Objectives of the study

To highlight the specific support academic libraries give to promoting lifelong learning among students, the following objectives were pursued:

- To explore the awareness levels of academic librarians in realizing the SDG target 4.7 in selected institutions.
- To investigate how academic libraries are supporting lifelong learning in the selected institutions.
- To ascertain how academic libraries develop independent learning skills among students in the selected institutions.
- To ascertain the challenges with current practices of academic libraries in promoting knowledge and skills for lifelong learning opportunities.
- To develop a model on how academic libraries can help promote knowledge and skills for lifelong learning.

Theoretical framework

The format in which lifelong learning follows differs from one model to the other. Some models emphasize education and training, or training and learning, or learning and development. However, this study adopted the 14th Integrated "Learning for a Lifetime" Approach, which addresses lifelong learning from cradle to grave. This model was found appropriate for this study because the researchers saw it as all-encompassing with regard to the variables of this study.

It is interesting to note that the model believes lifelong learning starts from the development of human potential through learning and training throughout life.

According to the 14th Integrated "Learning for a Lifetime" Approach, learning takes place at different levels of human life, and the learning is supported by different structures from families, communities, education, and industry. It can either be formal or nonformal. Learning at each stage plays an important role, and the development of a person needs coping skills in order to survive, hence the need for lifelong learning (Longworth, 2003).

The author of this model also mentioned partnerships in the promotion of lifelong learning, for example university and government or community (Longworth, 2003).

The reasons for lifelong learning are as follows:

- Demonstrates development of human potential through learning and training.
- Applies holistically within and between all sectors of the community—whole-of-life vision.
- Incorporates multiple partnerships for mutual advantage.
- Creates personal, organizational, national, international values, and attitudes (Longworth, 2003).

Implications of framework

All the above issues collectively impact the pressures that require fundamental modifications in education as they also create profound tunings in lifelong learning.

From the above model, lifelong learning is accomplished when people build up their knowledge and skills through learning and training. This training happens from commitments from various partnerships, for example, university-industry, government and communities, organizations, and associations. These, thus, result in the production of individual, organizational, and national development, with the assistance of science and innovation. All the variables from the 14th Integrated "Learning for a Lifetime" Approach were used. The researcher additionally singled out influence of science and technology by Longworth and Davies (1996, p. 25), which is a variable from changing paradigms for a lifelong learning age model.

Literature review

The concept of lifelong learning

Cohen (1975) observed that the scientific and technological developments in this century have made every one of us perceive that learning is a persistent, changeless, lifelong interest. He demonstrated that lifelong learning is a procedure, which initiates with birth and just ends at death and is then carried on by others in a ceaseless continuum.

Haggstrom (2004) added that the concept of lifelong learning contains different types of education and training, formal, nonformal, and casual. Thus, an individual who gets and keeps up a secondary school or college level of proficiency opens the way to connections for a lifetime (Agee, 2005).

Some characteristics needed by people to be lifelong learners include people who see change as a challenge rather than an obstacle and see solutions to their problems through continuous learning. Such people realize that they cannot remain qualified no matter how educated or intelligent they may be; they need refueling from time to time (Kanwar, Balasubramanian, & Umar, 2013). A similar study by Hamid and Soroya (2017) confirms that continuing education for LIS professionals improved their professional knowledge and skills which in turn helped them build confidence in the development of skills in their clients.

Libraries for some time were designated learning establishments for information and learning (Amusan, Oyetola, & Ogunmodede, 2012). The focus of libraries now, as highlighted by Wijetunge (2000), is to advance the knowledge and skills of learners as they tend to look for the learning material in a library. Notably, Haggstrom (2004) indicated that libraries can have effect between a traditional system of formal training and a more extensive system of learning while they serve as socially inclusive places and expert direction in information search. This really is what the SDG 4 is seeking to achieve.

IFLA observes the general role of libraries in promoting goal number 4 as the core of schools, colleges, and universities in each nation around the globe. Libraries bolster education programs, give a sheltered space to learning, and support researchers to reuse research and information to make new knowledge (IFLA, 2016). This implies that it is not only public libraries that must be at the forefront of promoting lifelong learning, but also that academic libraries in addition to their specific mandate could complement this effort by extending their services outside the academic terrain. This is even more important after Igbinovia (2017) revealed in his study that academic librarians have a high level of knowledge on the SDGs and that such an understanding could lead to the achievement of the UN 2030 agenda.

In the view of IFLA, libraries through access to information contribute to improved outcomes across the SDGs by advancing digital inclusion through access to ICT (IFLA, 2016). Access to information is a cross-cutting issue that backs the greater part of the SDGs. Library services add to

enhanced results over SDGs by promoting widespread education, including media and information literacy, and digital literacy skills (United Nations, 2016).

In response to Information Communication Technology (ICT), provided by academics Libraries in promoting the goal number 4, Cartwright and Hammond (2003) and Hew and Brush (2007) have noted that mix of ICTs to the education ambiances is giving an incredible commitment in accomplishing the decided objectives in educating and making learning dynamic and perpetual. In masterminding lifelong learning capabilities, Figel (2007) listed ICT competency and Digital competency among others must be taken seriously. Similar to this, Ozdamli and Uzunboylu (2015) and Tavukcu, Gezer, and Ozdamli (2009) have shown that the information and communication technologies give chances to the learners or students to create projects by working interconnected with Internet support ambiances and portable learning tools. In a study to find out how students use ICT devices to support and enhance their learning, Herrington, Reeves, and Oliver (2014) found that ICT devices play an important role in students' learning if they are used appropriately. Specifically, they promote independent learning, provide pupils with immediate feedback, and give easy access to information. The United Nations (2016) designates libraries to give information and Information Communication Technology (ICT) to enable individuals to build up the ability to viably utilize and preserve information to guarantee continuous access for who and what is to come.

More so, all efforts to promote ICT and lifelong learning are actually targeted at public libraries and national libraries and not academic libraries. This sustains the argument that there is a gap in the literature as far as promoting ICT and lifelong learning in academic libraries in extending their services beyond their core mandate.

In promoting and attracting learners into academic libraries, a research by Ashcroft (2004) found out that library services utilize an assortment of strategies to advance adult learning administrations, incorporating notices and flyers in libraries, publications and posters in partner organization centers, and site advancements. Promotional tools that can be utilized by academic libraries to advance their services and assets

include library websites, email records, blogs and podcasts, notices, introduction visits and workshops and different devices, for example, library publications, pamphlets, direct mail, Web 2.0 applications, and showcases (Fisher, Pride, & Miller, 2006; Alman & Swanson, 2014).

Leong (2013) explored how academic libraries in Canada, the United States, and China could connect resources between scholars and the public. He argued that community outreach such as community access, information literacy, cooperation, exchange and partnership, and exhibitions and scholarly events by libraries is the best approach to respond to in academic environment, which leads to developing lifelong learners. This implies that lifelong learning could be promoted on a larger scale if academic libraries partner with their respective communities in imparting such knowledge and skills.

Collaboration and teamwork for lifelong learning practices

In recent times networking, collaboration, and teamwork are playing key roles in our lifelong actions for businesses and society at large. The need for society to think and work together for productivity is on the increase, shifting the emphasis from individual efforts to group work and from independence to community (Leonard and Frankel, 2011). This also means that there should be infrastructure such as collaborative spaces which promote teamwork and studying in groups in correspondence to lifelong learning. In fact, according to Gayton (2008), the creation of facilities that do not support teamwork should be reassessed because such learning experiences build confidence and draw wisdom from a collective pool of intellectuals.

Montiel-Overall (2016) developed a theoretical understanding of teacher and librarian collaboration to support the changing population of students, complexity of educational issues, and increased information for lifelong learning. Similarly, Moore (2016) in his study revealed that collaboration between librarians and educators leads to the success of information literacy which is a lifelong skill. Again, extending support of learning processes involves collaborating with personnel such as librarians and faculty for new instructive strategies toward student learning (Bennett & Gilbert, 2009).

Moore (2016) is of the view that librarians and educators should collaborate for success when it comes to the teaching of information literacy skills. Weetman (2005) discovered overpowering support (97%) for information literacy (IL) among De Montfort University (DMU) academic faculty in the UK. Saunders (2012) in a study likewise discovered practically consistent help for creating IL skills at York University in Canada.

From these authors, it can be implied that, without the cooperation and teamwork of educators, the realization of lifelong learning becomes a very difficult task on the side of academic librarians.

Lifelong learning through information literacy skills in academic libraries

Academic libraries support knowledge and skills development through various initiatives. One of such initiatives are trainings on information literacy skills. There is therefore the need to review the concept of information literacy skills in academic libraries since it promotes lifelong learning among students. It is important because, in the view of Doyle (2003), information literacy skills help to access, evaluate, and use information from a variety of sources, to recognize when information is needed, and to know how to learn.

Various associations, researchers, and organizations have come out with complex mix of characteristics defining who an information literate person is. The Californian University Information literacy fact sheet (2000) based their attributes of an information literate person on that of the American Library Association (ALA) (2000) as an individual, who is able to:

1. Define the amount of information needed
2. Access the needed information effectively and efficiently
3. Assess information and its sources judgmentally
4. Include selected information into one's knowledge base
5. Use information effectively to accomplish a specific purpose
6. Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

Information literacy skills gained from an educational environment are combined to explore business processes in the workplace to distribute better service to clients and to the community. Thus, information literacy practice is an educational and career readiness success strategy, developing critical and creative thinkers, who know how to solve problems, utilizing a variety of information resources that produce quality results.

Challenges for libraries in supporting knowledge and skills for lifelong learning opportunities

In the view of Bengtsson (2013), the main reasons for the slow pace of lifelong learning implementation in universities, in general, is the lack of workable implementation strategies. To him, there should be a recurrent collaborative work within the library and faculty. Onoyeyan and Adesina (2014) lament that libraries are not adequately funded. Poor and inadequate facilities have also become an undermining issue for libraries to meet their goals of providing information for development and for the realization of lifelong learning. Akintoye and Opeyemi (2014) identified some factors as obstacles to achieving sustainable development in developing countries like Nigeria, and they are as follows: the priorities of governments and individuals are often short termed, corruption, lack of qualified individuals to create and actualize things.

Atta-Obeng, Boakye, and Kwamena (2017), in assessing the teaching of information literacy skills in Ghanaian Academic Institutions, identified incompetence on the part of student to independently use electronic search tools. These could be attributed to inadequate library staff, the lack of essential management commitment on trainings, ignorance of what information literacy stands for, the unwillingness of various departments to collaborate for effective development of such initiatives, erratic Internet supply, and inadequate technological infrastructure. The Tanzanian information literacy program is also subject to the aforementioned challenges, accompanied by lack of interest on the part of students and lack of dedicated policy to guide information literacy (Anunobi & Ukwoma, 2016). These challenges to information literacy program development and

implementation could be responsible for the difficulty experienced in attempting to promote lifelong learning initiatives (Anunobi & Ukwoma, 2016). In a recent study by Anyaoku, Ezeani, and Osuigwe (2015), they summed up the biggest challenges of lifelong learning as absence of information on information literacy/standard, absence of university sense of duty regarding the project, and absence of computers and other educating and teaching assets. There ought to be a more grounded concentrate on how abilities are really utilized in academic institutions to be transferred when necessary in life.

Materials and methods

Study design

The study employed qualitative research approach, because in this case, it could help to unfold and explain the phenomenon of the role of academic libraries in supporting knowledge and skills for lifelong learning opportunities with SDGs 4.7 in focus. The particular design under qualitative approach the researcher employed was the case studies methodology. Explanatory case study was the specific type used in this study as it clarifies the assumed causal connections in understanding the phenomenon under study in its genuine setting.

Sample and sampling procedure

The study consisted of three academic universities. The population of the study consisted three university head librarians and their deputies in the three universities, namely Ghana Technology University College (GTUC), Methodist University College of Ghana (MUCG), and Ghana Armed Forces Command and Staff College (GAFCSC). In all, six respondents were purposively selected, because they were extremely key with respect to the issues encompassing the objectives of the study.

All participants are qualified people who work in the library with at least a first degree qualification and have worked in the library environment for at least 2 years. The selection was based on the aims and objectives, age, hallmark of SDGs in the library, and their position in university rankings in Ghana.

- Age of the university: These libraries were selected because they had been in existence for more than ten (10) years and are striving for excellence all the time.
- Hallmark of the SDGs in the library: A preliminary investigation of the researcher revealed that two of the university libraries selected for this study displayed the SDGs boldly on banners and kept it in their libraries.
- University ranking: Even though two of the selected universities are private universities, a web ranking on the top universities in Ghana 2016 revealed that GTUC placed 5th while MUCG placed 19th in the ranking. This shows that they are rubbing shoulders with the top public universities in terms of presence, impact, openness, and excellence of their resources in Ghana (Webometrics, 2017).

Mode of data collection

Interviews were conducted with the aid of an unstructured interview guide to solicit the views of the librarians on the topic. The interviews took place in offices of the head and deputy librarians at their convenience. After each interview, the recorded information was played back to confirm the recording and voice clarity. Notes were also taken during interview sessions for backup. Additional documents provided guidelines in assisting the researchers with their inquiry during the interview. The literature was also consulted as secondary data for this study.

Data analysis

Content analyses was used to evaluate the responses of the participants of the interviews. The interviews were transcribed verbatim and then compared with the audio tapped data for any misrepresentation. In the interpretation of data, the researcher coded and categorized each item of data so contrasts and similitudes were explored for idea and agreed on interpretative conceptual labels that might be known based on the objectives of the study.

Brief profile of libraries

Ghana Technology University College

Ghana Technology University College (GTUC) is a privately owned tertiary institution setup in the year 2005. The school has about 7,000 students. GTUC was selected because, although it is a private institution, it has public interest, thereby, seeking able people who are interested in business and entrepreneurship in the country, providing them with information and communication technology to reduce inequality in students (GTUC, 2006).

Methodist University College Ghana

Methodist University College Ghana (MUCG) was founded in 2000 and currently has a student population of about 4000. MUCG was selected because it aims at promoting knowledge and its practical application to social, cultural, economic, scientific, and technological problems (MUCG, 2016).

Ghana Armed Forces Command and Staff College

Ghana Armed Forces Command and Staff College (GAFCSC) was established in 1963 and currently has a student population of about 150. The college enhances interest of national development, leadership, analytical, and communication skills through research and active development of knowledge (GAFCSC, 2014).

Findings of the study

Based on the objectives of this research, the following findings were made. For purposes of anonymity, we would represent these three libraries with alphabetical letters A, B, and C but not in any order.

Awareness levels of academic librarians on the SDGs

All participants specified they were aware of the SDGs in general and mentioned something similar to what unit "A" said. They further cited avenues through which they became aware of these developmental goals.

Specifically, unit A said "yes, it's a follow up on the Millennium Development Goals … through the Internet, materials from UN, conferences attended

both home and abroad, alerts from the news, and Continuous Professional Development programmes."

It is worthy to note that respondents were able to indicate that goal 4 focused on education but could not tell which particular target focused on lifelong learning. The researchers inquired from these librarians to state the precise provisions which linked the SDGs to lifelong learning and their indulgence as academic libraries.

Their indulgence in the SDGs, however, clearly demonstrated little advocacy of the goals in relation to lifelong learning across the three units.

A: No conscious policy to advocate for them because people have concerns as to how these goals would benefit them as a private institution … I however talk about them and gather materials for those who show interest in them on individual levels.

B: No formal events and programs to advocate the goals.

C: We only gather publication of articles in relation to the goals (4&16) in the College's magazine. Our Library has a UN Information Desk which publicizes activities of the UN.

Though goal 4 is on education, the specific provision of goal 4 target 7 is in the researchers' view directed at the academic library.

Furthermore, specific efforts currently showing some signs of promoting SDGs target 4.7 were some displayed banners, exhibitions, and flyers in the library as well as special literature related to such issues. These were said by all the libraries interviewed.

In relation to what lifelong learning is all about and efforts to achieve it, the findings appeared that all the librarians interviewed clearly had knowledge on lifelong learning and means to arrive at it.

A: I allow trainings for staff to keep abreast with technologies since they are critical for administering our work as library workers. Four of my staffs were supported to travel to South Africa as a way of Continuous Professional Development.

C: I have attended conferences on lifelong learning myself and we give training on some skills especially ICT skills once a while but we do not have a special initiative to address lifelong learning … the lack of funds has inhibited the library's ability to undertake any initiatives.

B: We offer academic upgrading to meet the contemporary educational trend and the library work

as a whole. Occasional programs held by the Ghana Library Association, Continuous Professional Development organized by CARLIGH….

Support for lifelong learning in academic libraries

On this issue, all participants integrated programs to enable users acquire adequate baseline knowledge of fundamental information searching skills.

These were in the form of the creation of learning activities and platforms such as reading rooms, search strategy, and information literacy skills trainings. This is what they had to say:

A: We have reading rooms, search strategy trainings, discussion rooms, trainings on research publications, OPAC, e-resources with leaflet to go online to look for the information themselves … from time to time we organize trainings, … the self-help they give to themselves when looking for books on the shelves help them acquire basic searching skills.

B: Through teaching communication skills and information literacy skills to help students acquire knowledge in using e-resources to find information, sum it up, use and share or store when necessary.

C: We provide access to both print and electronic resources. Automated library routines make it easier for patrons to access information on electronic platforms. We also offer Information search and retrieval techniques to impart patrons with current technologies.

Most of the respondents stressed on the fact that the very nature of lifelong learning implies that much support is needed to facilitate activities that promote it. However, the finding shows that there are no specific budgets dedicated to specifically promote lifelong learning opportunities. Rather, part of the annual budget is sometimes used in this direction. This issue needs clearly more attention in promoting the Sustainable Development Goals:

C: No specific financial support towards developing lifelong learners but whatever we get is distributed towards the development of activities for lifelong learning.

With concerns bordering on the findings how academic libraries collaborate between and among faculties and departments in promoting

lifelong skills, this was what the respondents had to say:

> A: we provide literature and connect the faculty to experts for networking and give advice on information sources. Some academic departments chip in talks from the library during lecture time especially the MBA classes on techniques of searching skills.

> B: With the faculty in teaching some of these courses.

> C: Yes with the registry in collaboration with the Research and Development Department.

Developing independent learning skills among students

There was general agreement by librarians on how specific library services and facilities such as fast Internet services, digital services and serene reading spaces improve concentration and encourages creativity, innovation, and motivation for continuous learning.

> A: We do provide assistance to students on how to do literature searches so that they can master them independently, quiet study place, information literature skills training, computer and Internet facilities, help them buy books from their own pockets since we know most of the publishers, book lending services and link them to experts, reference service, electronic support sector service and the lending and customer service where we deal directly with students.

> B: Digital library services, reference services, collection development and other user policies which allow students to look for information themselves. We also have physical technological facilities and a digital repository.

> C: Secluded library tables to enable students study without interference. Also students who disturb in the library are asked to walk out while phones of individuals are meant to be put off or put on silence. Periodic orientation of freshmen on the user's manual of how to access the library online and providing slides for students on the use of the e-resources when necessary among others.

Respondents again had a unified view on how educational sites available to support teaching and learning in the library served this same purpose. These sites motivated students to develop and apply new skills in their daily lives. This encourages them to be critical thinkers, problem solvers, and decision makers. All respondents were members of the Consortium of Academic and Research Libraries in Ghana (CARLIGH) and shared similar examples of educational sites provided by unit C.

> C: We use UNESCO site, scholarly electronic journals and write ups such as, emerald, Wiley, Ebscohost, Jstor.org, Taylor and Francis Oxford University Press, Hinari, Oxford University Press, African Journals Online, etc. They can be accessed in and outside campus via the Internet. We also allow experimentation with different sources. The more you alter your search question, the more you think critically, which invariably leads to creativity and innovation.

For a respondent, contact with the Alumni bodies and outsiders also served as a means for motivating learners. In fact, according to this respondent, even though they are not public libraries they try to reach out to the public because outsiders rely on them for the provision of timely and reliable information especially after school:

> B: We are also open to Alumni and even outsiders. Even though we are not a public library, we reach out to our community especially residents around come to read newspapers and magazines.

Challenges with current practice of academic libraries in promoting lifelong learning

Participants did identify various challenges with current practices and mentioned few.

It is perhaps funding that lies at the core of these issues. Both the public and private universities interviewed mentioned it. Moreover, in mentioning financial constraints they were quick to call on government intervention so they can deliver on issues that bother on lifelong learning leading to the fulfillment of the SDG goal 4 target 7.

> A: Financial challenges is really a problem for private universities, in fact no governmental support to help us achieve information literacy to the fullest.

> C: Financial Constraints has been a major aside all that I have mentioned. The government should make it a point to support so we can deliver.

The findings also appeared students do not appreciate what lifelong learning is. This observation was made by one respondent who said:

B: Students don't appreciate the concept of lifelong learning skills such as information literacy skills and are eager to complete and leave the university.

Library A displayed grievance as he noted that if lecturers should give challenging assignments which would require searching critically through a collection of library materials before solving a problem, most students would develop lifelong skills. Lack of collective responsibility, therefore, emerged as a challenge in this study.

A: It should be a collective responsibility of the library and faculty to promote lifelong learning skills. Lectures should give challenging assignments which would require searching through a collection of library materials before solving a problem.

Again, the inertia of the university towards lifelong learning however, appeared rather not in an attractive manner. Thus, there is the lack of facilities to support creativity and not enough training rooms as well.

Based on the views of:

B: The University at Large has not developed enough materials and learning facilities for lifelong learning. There are not enough facilities to support creativity for instance. Not enough training rooms.

Pointing out to the same challenge, another respondent opined:

C: The major challenge is that the university is not providing adequate space. There is also the challenge of not getting the recommended materials when needed by the students.

Furthermore, due to the private nature of a particular university, lifelong learning was not a statutory focus. Thus, one respondent observed that

A: Unless the university takes it up as an objective; little can be done by the library because we are to support their learning in school only and not pushing the agenda of lifelong learners.

This assertion defeats the very purpose for which universities exist. The insufficient nature of public libraries has paved the way for academic libraries to lead the way in promoting lifelong learning.

Inadequate staff was a common complaint gathered from this study. One respondent added that if it were a credit-bearing course, students would have appreciated it. This observation is right on point and in the view of the researchers, must be given a critical attention.

C: Not enough staff to introduce it into the curriculum. If it were a scoring course, the students would have appreciated it and would have taken it serious to take it into their future.

Putting it more succinctly, another respondent in the same vein pointed that:

A: Human resources to help in the realization of this SDG goal is a major problem. We are poorly staffed and more hands are needed to help achieve this goal.

Internet connectivity has always been a problem in most countries in Africa and Ghana is no exception. In fact, the cost of purchasing this bandwidth coupled with erratic power supply has made use of the Internet difficult.

B: Materials are not easily accessible due to inadequate funds to purchase high speed data bandwidth for students … computers are also not enough to meet the growing population.

A: Computers and erratic Internet connectivity has been a problem for this library and the university at large.

A consistent theme emerged on trainings held on Information Literacy skills. As an outcome of the above responses, a follow-up question was asked on how information literacy training was conducted and the responses disclosed the following:

A: … no well-structured curriculum based training but we organize periodic training for targeted groups and on request.

B: We organize trainings class by class on how to use the library resources especially the electronic resources in small groups at a time and as at when it is needed.

C: Its embedded in the training on electronic resources. During library orientations, patrons are taught information literacy skills.

Findings very well prepared with documentation displayed lack of facilities for information literacy training relating to the already mentioned challenges.

Strategies that can be used by librarians toward the actualization of SDG target 4.7

Views of librarians on strategies that can be used by library and information science

practitioners toward the actualization of SDG 4.7 are explained.

First, some librarians suggested that there should be collaboration between faculty and the library to foster the realization of SDG target 4.7. According to them, the SDGs cannot be achieved only on the strength of the library without little support from the faculties. This is what they had to say on the matter:

> B: I think we need much more collaboration between library and faculty. SDGs is a big vision and a small library such as ours cannot alone undertake activities to make sure this vision is realized.

> C: The faculties must be incorporated in this whole matter when it comes to students and issue of lifelong learning.

Again, they intimated that the community must be involved through the contribution of money to finance projects that will enhance lifelong learning activities. They indicated that since lifelong learning is not limited to only students and that the community formed part of the vision, their involvement is necessary.

> A: The community forms part of the vision of the SDGs and therefore their involvement is key… more especially because the university is also in their community.

> C: We need the community to help us in terms of money so we can expand our infrastructure because they form part of the process of learning.

Regarding collaboration again, two head librarians gave a profound suggestion with ministry of education and the Ghana Library Association (GLA) helping in the SDG initiative which bothers on the library. This is what they had to say;

> A: Institutions such as the GLA and ministry of education must take it up first and then we the smaller ones can be roped in and together we can make this SDG work.

> C: We appear far detached from the GLA in terms of issues like this. I think there should be an effort between GLA and other academic institutions to make this SDG a reality.

In nutshell they were calling for a more conscious and firm collaboration among stakeholders such as Ministry of Education and the Ghana Library Association to be actively involved in promoting and setting the agenda for the SDG 4 Target 7.

Discussion of findings

Awareness of the SDGs

As displayed in the findings, it was found that all participants were aware of the SDGs in a general sense. This is comparable to an earlier study by Igbinovia (2017). His study reveals that academic librarians have a high level of knowledge on the SDGs and that such an understanding could lead to the achievement of the UN 2030 agenda. This awareness was as a result of conferences attended, advocacy group of the Ghana Library Association, and the Internet among others. This means that there is an appreciable level of awareness in relation to the SDGs but not specifically in relation to the particular target under study.

The library has a role to play with respect to the SDGs, and this role is in the area of promoting lifelong learning. Amusan et al. (2012) rightly observed that libraries have for some time been delegated as the foundation of information as they give the general population spaces for data, learning, and information. Sadly, findings from the study revealed that there are no clear-cut and conscious policies for the realization of SDGs specifically targeting goal 4.7. The SDGs goal 4.7 clearly states that, by 2030, it would ensure that all learners acquire the knowledge and skills needed to promote lifelong learning (United Nations, 2016). Thus, the use of displayed banners, exhibitions, and flyers in the library is not enough to drive home this agenda.

According to the findings, the librarians explained that lifelong learning is a continuous learning process in which they themselves undergo to stay updated in their quest of being deliverers of such generic skills of a lifelong learner. Efforts by these libraries showed that all the institutions take up opportunities to update themselves in the field by way of Continuous Professional Development courses help in both home and abroad. Lifelong learning is important to meet the requests of the present quick paced, regularly changing work environments requiring an expanding measure of learning and flexibility from employees as proposed by Hamid and Soroya (2017). They study confirms this same finding revealing that continuing education for LIS professionals improved their professional knowledge and skills, which in turn

helped them build confidence in the development of skills in their clients.

Furthermore, the findings showed that lifelong learning initiatives in the form of conferences, library orientation, and literacy skills were performed by these libraries. Specific kinds of initiatives such as website development to cater for alumni, searching techniques, and trainings organized by the Ghana Library Association were mentioned. The finding also supports "The 14th Integrated "Learning for a Lifetime" approach model and indicates that multiple partners come together for a mutual advantage of developing lifelong learners (Longworth, 2003). If Ghana Library Association, for instance, does not organize conferences, trainings, library orientation, and literacy skills, among others, perhaps librarians themselves would not have been involved in any lifelong initiatives to impart unto others.

Academic libraries support for lifelong learning

Findings on how academic libraries are supporting lifelong learning in selected institutions here would help establish whether or not the SDG 4.7 is actually being followed by librarians as they claim.

The findings revealed various activities undertaken by librarians to support lifelong learning such as the creation of reading rooms, the trainings on search strategy, debate programs, reading clubs, and trainings on research publications develop lifelong learners. Again, the study revealed that Communication and Information Literacy Skills teaching, training programs, and Library orientations for new students were also done for student within these institutions. In addition, providing access to both print and electronic resources makes it easier for patrons to access information whenever the need arises. Amusan et al. (2012) corroborate this finding by giving strong indications from their study that libraries provide access to credible print and electronic information for development. The responses gathered confirm variables from both of the models adapted for this study which indicated that trainings supported by the use of information technology lead to the development of lifelong learners (Longworth, 2003; Longworth & Davies, 1996, p. 25).

Academic libraries development of independent learning skills among students

With regard to educational sites provided on different Information Communication Technology (ICT) tools to encourage independent learning, various researchers have posited that mix of ICTs to the education environment is giving an incredible commitment in accomplishing the decided objectives in educating and making learning dynamic and perpetual.

The findings of these institutions revealed that learning tools via educational sites, provision of scholarly electronic journals, and write ups help students develop independent learning skills. Furthermore, library services such as Digital library services, Online Public Access Catalog and instructional services allow all students to look for information themselves encourage creativity and innovation. Additionally, fast Internet service provision and available literature via databases also motivate continuous learning.

The findings were similar to Ozdamli and Uzunboylu's (2015) study, which showed that information and communication technologies give chances to learners or students to create projects by working interconnected with Internet support ambiances and portable learning tools.

Closely linked to the provision of these is a good financial steering. In contrast, findings established the fact that finances have been a headache in most libraries in Ghana and for that matter and showed that there are no specific budgets allocated for the progression of lifelong learning opportunities. Rather, part of the annual library budget is sometimes used in this direction. It is a pity to see how a whole goal of such an agenda (SDGs) will go without financial support.

On collaboration, the researchers think faculty teamwork is key to ensuring that lifelong learning works in academic institutions and yonder. However, the findings showed that such collaboration somehow existed in all three selected institutions under study. This particular finding supports one variable in the model, "The 14th Integrated "Learning for a Lifetime" Approach". The model argues that lifelong learning applies comprehensively inside and between all segments of the community, that is, entire-of-life vision

(Longworth & Davies, 1996, p. 4). It is also interesting to note that all the models mention partnerships in the promotion of lifelong learning, e.g. university-industry, government and communities, companies, universities, and school education inclusive (Kanwar et al., 2013). The findings also corroborate the results of studies by Montiel-Overall (2016) and Moore (2016).

Collaboration as a word is to be taken seriously at the mention of lifelong learning. Perhaps there is less conscious effort to make the principle of collaboration work to ensure that lifelong learning opportunities are realized.

Model on how academic libraries can promote SDG 4.7

To show our contribution to knowledge, a new model was proposed and future research would have to examine some aspects of the model which is not in the framework on how academic libraries can promote SDG4.7. The United Nations which created the SDGs have a role to play in ensuring the success of the SDG 4.7 too. Academic libraries could collaborate with the ministry of Education, Ghana Library Association, academic faculty and the community by consciously holding conferences, workshops and seminars sponsored by the

United Nations itself, or the home associations. When this is done, specific roles could be assigned other than just creating awareness of these goals. Furthermore, there should be team work between public libraries and academic libraries in finding solutions to lifelong learning acquisition on a larger scale.

This proposed model is different from the theoretical framework because it recognizes the influence of science and technology in the organizational context of work for academic library's support in promoting lifelong learners.

In view of this, the researchers proposed this model to help guide the process (Figure 1).

Recommendations

Based on the findings of the study, the recommendations are as follows:

There should be partnership between public libraries and academic libraries in promoting lifelong learning. Both the literature and the results of this study propose that the right kind of library responsible for ensuring lifelong learning is the public libraries, however, looking at inadequacy of public libraries in Ghana the researchers recommend that academic libraries should be encouraged to function as centers of
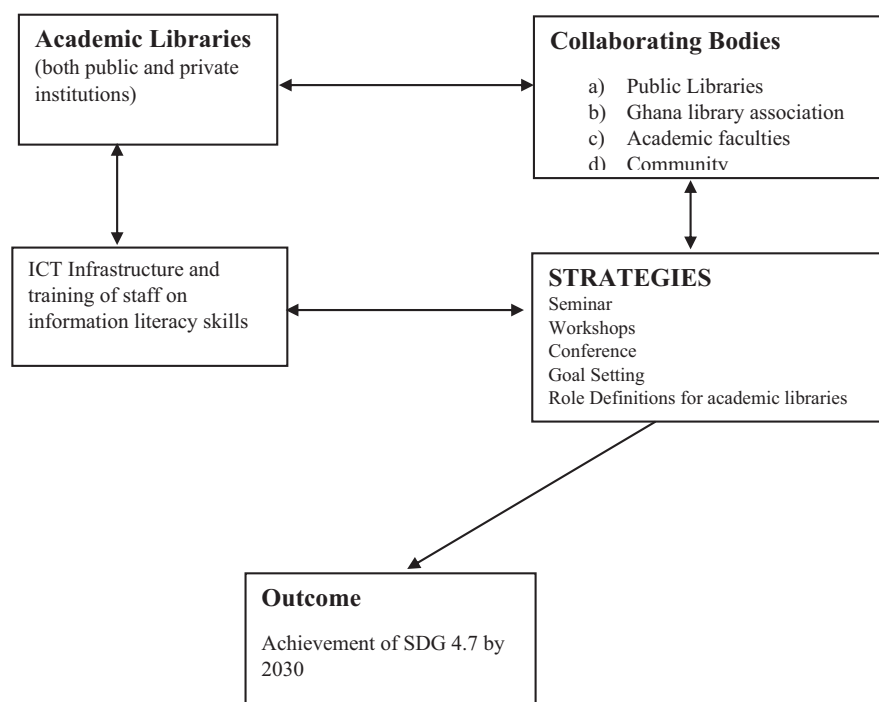

Figure 1. Proposed model of lifelong learning for Academic libraries.

communities. This in the researchers' views would help supplement the effort of public libraries in Ghana to realize the SDG 4.7.

Furthermore, institutions such as GLA and the Ministry of Education could intensify their collaborative efforts with academic libraries by giving them specific roles and responsibilities for the advocacy of knowledge and skills needed to develop lifelong learners for sustainable development as proposed by interviewee 'C'.

In addition, GLA should push the agenda of making sure that information literacy skills are compulsorily taught in all public and private universities in Ghana. This in the researchers' views would make lifelong learning a statutory focus for most universities as revealed by interviewee 'B' and suggested by interviewee 'C'. When this recommendation is taken into consideration the issues of inadequate staff to introduce information literacy into the curriculum would reduce, since University of Ghana is producing yearly students with multiple degrees in information studies.

Finally, since the researchers are pushing the agenda of academic institutions supplementing the effort of public libraries in promoting lifelong learning, academic libraries should use these as a means to solicit funds from the public sector to provide the needed computers and their accompanying accessories in order to be able to provide enough facilities to support creativity as suggested by interviewee 'C'.

Conclusion

Academic libraries offer an essential role in making sure that the target of SDGs in ensuring that by the year 2030 all learners acquire the knowledge and skills needed to promote sustainable development is met.

Conspicuously missing is the adequate financial support to promote this agenda. The study brought to light some of the challenges faced by academic libraries in their quest to promote lifelong learning among selected universities, and these include among others, low support from the academic faculty, low number of computers and their accompanying accessories, inadequate staff to introduce the teaching of information literacy skills

into the curriculum, as well as insufficient facilities to support creativity and teamwork.

The study, therefore, concludes and proposes strategies that could be employed by academic librarians to promote further lifelong learning opportunities for all.

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