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Access to E-Journals and E-Publishing Initiatives in Ghana: Successes, challenges and lessons learnt

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Abstract

Electronic journals and electronic publishing are new ways of gaining quick access to a great number of research information and disseminating globally, research information easily and quickly respectively. Their positive properties far out weigh the negatives as far as research and its output for development are concerned. Peer- reviewed Open Access journals have even made e-journals and e-publishing the choice of many researchers because of its options of cost effectiveness and great visibility of authors.

The paper shares experiences in efforts made to gain access to e-journals for research and academic use in Ghana. Projects like INASP's PERI that offered access to some e-journals at no cost to Ghana for two years but now are being paid for, AGORA, HINARI, OARE, eIFL.net and JSTOR which make a great number of e-journals available to developing countries including Ghana, are presented. The various e-publishing initiatives introduced to researchers and editors of scholarly journals in Ghana and whether there is adequate training and infrastructure to handle these initiatives as well as the availability of such e-publishing concerns are discussed. The activities of the Ghana Library Consortium (CARLIGH) to further these causes are featured.

Challenges faced and how they were surmounted in the process of making relevant e-journals available to the research and academic community as well as using e- publishing methods for the wide dissemination of Ghanaian research results are presented to serve as lessons for individuals and institutions thinking of gaining access to e-journals or embarking on e-publishing.

Introduction

Developing countries differ from developed ones not only because they have less capital but because they have less knowledge. This was the theme of the World Bank's World Development Report Knowledge for Development¹. The report stated that creating knowledge is often costly, and that is why much of it is done in developed countries. However, developing nations, the report stressed, can acquire knowledge overseas as well as create at home, knowledge that may not be readily available elsewhere. Access to e-journal literature is therefore an essential ingredient to successfully narrow the knowledge gap between developing and developed countries.

The creation and dissemination of knowledge is a fundamental aspect of an academic environment. Scholarly journals have been the traditional outlet for disseminating knowledge. The prestige and perceived quality of articles in these journals has enabled the evaluation of faculty contributions resulting in positive or negative promotion and tenure decisions. However, some believe that the traditional paper journal will disappear from the landscape within the next 20 years, necessitating a change in the process of academic scholarship and the manner in which it is assessed².

E-Journals

Electronic journals have offered great promise for a revolution in scholarly and scientific communication since their inception in the late 1980s. With their exponential growth over the last five years, e-journals have generated an upheaval in traditional scientific publishing houses and have revolutionized libraries. Current developments in e-journals and their institutional licensing and subscription arrangements clearly signal a rapid revolution³.

The number of journals is increasing, publishers are demanding high costs and grabbing the copyrights for the information content, and the inability of libraries to meet the increasing needs of their users making the scholarly communication system to undergo a "technological" transformation. The academic and research community is facing a new challenge of communicating their research in the context of the Internet⁴. The research community in Ghana is eager to get involved in this new mode of scholarly communication. This is backed by the desire of libraries to assist in gaining access to global research to support local ones.

Simply put, an e-journal is a digital periodical that publishes on the Internet or World Wide Web (WWW). An e-journal may not be all that different from a print journal in the fundamental editorial process, that is, articles are submitted by individuals in the academic and practice community, are peer reviewed by editorial board members of the journal to be accepted or rejected, and subsequently published. It is the digital medium of presentation that is different⁵. An e-journal in essence has content as in print, only the mode of presentation has been changed.

Electronic journals relatively provide efficient access to information, and thus they are easy to distribute to library patrons than the traditional print. And "in the financially stringent environment of Higher Education (University) System, electronic journals have the potential to become a medium which is cheaper than the traditional printed journals and which can be circulated to the researcher network"⁶. This is an apt statement because the library consortium environment in Ghana has made online journals cheaper than print and available for simultaneous use. This mode of presentation has brought in several new dimensions about scholarly journals. Guissani⁷ puts this in a succinct way that "there is no doubt that this different medium of presentation has many implications in terms of cost, page allocations, and interactive communications with readers. The different medium also changes the manner by which the journals are used; the ability to click to

an abstract or full text citation for a reference drastically changes the reader's capability to locate references. These hypertexts within electronic articles have the ability to create a genuine web of information which can take into account the different approaches, sources, and media, and can be hyperlinked together. Such capability changes the journal's perspective, as well as, the reader's"

Rightly so, Moghaddam and Talawar⁸ state that "there are many attributes of electronic journals which appeal to the user as they become more prevalent. Global distribution and speed of access are vital ingredients which are improving and also the ability to access from different sites, the several searching facilities and the use of hypertext links being great assets. A bibliographic database may link to the full-text of articles. Articles may contain links to other articles, references or collections of data. Interactive features could turn a research paper into something approaching an online conference, and multimedia features could enable a multidimensional quality which could never be achieved in text alone. Additionally e-journals have the following qualities: easily accessible - direct accessibility from researchers' desktops; easy to publish ; downloading (or printing out) of articles directly; currency; no physical barriers; full-text retrieval possibilities; time saving; low cost (sometimes free); authors and readers get closer.

According to Raney⁹ for e-journals to be accepted they must meet the primary requirement of scholarly publication, that is, quality of content; address the problems of the current system, for example, slowness of publication, spiraling costs; provide extras which the old format cannot, like, multimedia; improve access to information in terms of convenience, speed, and range of materials; increase access possible for simultaneous users and remote users; resemble recognizable print journals.

Some barriers to effective use of e-journals include the lack of long-term access and incomplete volumes especially when one discontinues subscription and so loses backsets; network dependency; reading from a monitor or the dislike of reading from screen; loss of certain attributes of the paper version; quality of graphics; and lack of citation status and standards; lack of awareness about e-journals; difficulty of locating e-journals; the technology; and their perceived lack of prestige¹⁰.

Morris¹¹ also identifies citation and definitive version and perpetual access and archiving as challenges as well as Easton¹², also adding pricing strategies, interfaces and formats to the catalogue of barriers. Indeed the issue of archiving also remains unresolved.

Most often people think that e-journals and e- publishing are one and the same. Sparks¹³, states that there is sometimes confusion between "e-journals" and "electronic publishing." Some consider any communication via electronic medium to be electronic publishing but electronic publishing and e-journals are not synonymous. For example, electronic publishing may be e-mail communication, or listservs, or newsgroup messages. For our purposes, we consider only those e-journals that are peer reviewed and other scholarly documents as e- publishing.

E-Publishing

Electronic publishing according to Morris¹⁴ is the "making the content of the journal (the full text of the articles) available online." It is also relevant to add the availability of any scholarly publication online as e-publishing. Electronic publishing is now being embraced by the scholarly community who see it as attractive and an alternative to high financial outlay of the print version. It is however important for an institution to examine the positives and negatives of e-publishing before deciding to go into it, so that efforts and funds will not be wasted. Usually the publisher's main objective, that is, the necessity to publish, the information to be published and the expected readership, need to be clearly defined first. Morris¹⁵ states that

electronic publishing is often considered as having six advantages over print, that is, international reach, speed, additional capabilities, lower cost, new publishing opportunities and sustainability. One cannot agree with her more.

With the emergence of the Internet, publishing has become very easy, quick and cheap in a medium that can be accessed easily by everyone from anywhere. With the advent of electronic publishing, the scholarly communication landscape at universities has become increasingly diverse. University “publications” not only include those of the university presses and society journals but can also include forms such as preprints, digital library collections, databases, personal Web pages, course materials, and lecture webcasts. Multiple stakeholders including university presses, libraries, and central IT departments are challenged by the increasing volume and the rapidity of production of these new forms of publication in an environment of economic uncertainties¹⁶.

According to Nelson¹⁷ the potential of electronic publishing to revolutionize scholarly communication lies in the following features; the ability of individuals to publish their own work on the WWW, making it freely available to the scholarly community; the development of pre-print servers in some subject areas, speeding up the publication process; the success of some learned societies in publishing high quality peer-reviewed journals which are either free, or at least cheaper than equivalent journals from commercial publishers, and which publish articles much faster; the fact that e-journals no longer need to follow traditional journal formats, allowing separate articles to become the units of publication; the ability of the electronic medium to transform e-journal content by including links to other materials, multimedia presentations, access to databases, and interactive possibilities.

E-publishing and e-journals are partners who hold a lot of promises for the Ghanaian scholarly community and also the libraries that strive to satisfy the scholarly needs of their users. In Ghana several efforts are in place to ensure that success is achieved in these areas.

Access to E-Journals in Ghana

The academic and research community in Ghana need research information from other parts of the world to enrich their own work and also to secure avenues for collaboration in order to disseminate their own research. Access to e-journals and also the indication of authors of articles in these e-journals have come in to solve these problems.

INASP

In 2002 the Danish Development Agency (DANIDA) provided funds to INASP (International Network for the Availability of Scientific Publications) to negotiate licences and make available online scientific journals to five (5) institutions in Ghana namely University of Ghana in Accra, Kwame Nkrumah University of Science and Technology, Kumasi, University of Cape Coast, Cape Coast, University for Development Studies, Tamale and the Institute for Scientific and Technological Information (INSTI) in Accra, the umbrella body for access to information for the research institutes in Ghana. These e-journals were provided by INASP through the Programme for Enhancement of Research Information (PERI) which is still going on. PERI works with publishers and libraries to give access to scholarly information to researchers in developing and emerging countries¹⁸.

In Ghana access was made available to some online databases with CD ROMs for some of them¹⁹. The online databases that were paid for were EBSCO Host (<http://www.search.epnet.com>), Emerald

(<http://www.emeraldinsight.com>), Cochrane (<http://www.interscience.wiley.com>), Gale Thomson (<http://www.gale.com>), Blackwells Synergy (<http://www.blackwell-synergy.com>), Royal Society of Chemistry (<http://www.rsc.org>), Multilingual Matters (<http://www.multilingual.matters.com>), AJOL Journals (<http://www.ajol.info>) and document delivery from British Library Document Supply Centre (<http://www.bl.uk/services/document>) .

Those that were on free access were Oxford University Press (www.oup.co.uk), Mary Ann Liebert (<http://www.liebertonline.com>), Institute of Physics (<http://journals.iop.org>), American Physical Society (<http://publish.aps.org>), Annual Reviews (<http://arjournals.annualreviews.org>), Beech Tree Publishing (<https://www.ingentaconnect.com>), National Academy Press (<http://www.nap.edu>) and, AJOL Document Delivery (<http://www.ajol.info>)²⁰ .

Currently, CARLIGH has free access to the following resources through PERI ; Oxford University Press, (<http://www.oup.co.uk>), Mary Ann Liebert (<http://www.liebertonline.com>), American Physical Society (<http://publish.aps.org>), Annual Reviews (<http://arjournals.annualreviews.org>), Beech Tree Publishing (<https://www.ingentaconnect.com>), Cochrane Library (<http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME>), Geological Society (<http://www.lyellcollection.org/>), Mineralogy Society of Great Britain & Ireland (<http://www.minabs.com>), Nature Publishing Group (<http://www.nature.com>), Optical Society of America (<http://www.opticsinfobase.org/>), Royal Society Journals Online (<http://publishing.royalsociety.org/>), Royal Society for Chemistry (<http://www.rsc.org>), Symposium Journals (<http://www.symposium-journals.co.uk>), University of Chicago Press (<http://www.journals.uchicago.edu>) and AJOL Document Delivery (<http://www.ajol.info>).

CARLIGH

When DANIDA assistance was coming to an end in 2004, the Consortium of Academic & Research Libraries in Ghana (CARLIGH) was established to take over the role of DANIDA in sustaining access to online resources and organizing training activities for its members, among other things²¹. CARLIGH is open to all academic – university, polytechnic college of education - and research libraries in Ghana. Membership is by application and signing an Agreement with CARLIGH.

Currently, CARLIGH is responsible for negotiating and licensing databases that contain the e-journals available to the academic and research community in the country. Databases are made available to these libraries on subscription basis. Total cost for selected databases are shared equally among its current 18 members.

Access to e-Journals on Subscription

Databases available on subscription currently are EBSCOHost Complete, Wiley-Blackwells Synergy, Emerald, and Britannica Online.

EBSCOhost

This is a very comprehensive full text peer-reviewed journal articles in many disciplines with Pdf archives back to the first time some of the journals were published. It also abstracts and indexes articles and has some reviews. A visit at the website will provide more information. www.ebscohost.com

Wiley-Blackwells Synergy

This consists of over 840 peer reviewed journals covering a wide array of disciplines. With the merger of Wiley and Blackwells, all journals that were on Blackwells Synergy are now on Wiley InterScience. (<http://eu.wiley.com>).

Emerald

This is a database that has full text articles and abstracts from 50 journals and reviews from the world's top 300 management journals. Emerald gives additional information on the properties of this resource.

Britannica Online

This is the online version of the print version of Encyclopaedia Britannica but with several other features that the print version does not have. www.britannica.com provides more information about this service.

Access to Free e- Journals

In addition to the databases that are on subscription, there are some available to the research community that are accessed at no cost to the institutions in Ghana. These can also be accessed by some developing and transition countries.

AGORA – Access to Global Online Research in Agriculture.

This programme is set-up by the Food and Agricultural Organization (FAO) with some major publishers. It gives access to 1278 major scientific journals in agriculture, and related biological environmental and social sciences. It is available for free to Ghana and other 106 developing countries. Each institution registers directly for it in order to gain access (<http://www.aginternetwork.org/en>).

HINARI – Health Inter Network Access to Research Initiative.

This programme was put together by the World Health Organization (WHO) with some major publishers. It makes available over 3750 top level journals in biomedical and health literature to researchers and health workers in 113 developing countries including Ghana. Here too each institution has to register directly with WHO to gain access to the resources (<http://www.who.int/hinari/en>).

OARE – Online Access to Research in the Environment.

This is an international public/private consortium that is coordinated by the United Nations Environment Programme (UNEP) and major science and technology publishers. It makes available over 1000 scientific journals on environmental science to about 70 low income countries. With this resource too institutions in Ghana have to register individually for it (<http://www.oaresciences.org/about/en/index.html>).

eIFL.net – Electronic Information for Libraries Network

eIFL.net is a membership organization. CARLIGH is a member of eIFL.net. Among other activities it makes available e-resources to Library users in transition and developing countries. It negotiates affordable subscriptions through country consortia. It benefits in other areas but specifically for e-resources,

CARLIGH has access to some e-journals like, BioOne (<http://www.bioone.org>), Cambridge University Press (<http://www.journals.cambridge.org>), Oxford Reference Online (<http://www.oxfordreference.com>) and Institute of Physics Publishing (<http://journals.iop.org>) on free basis. Institutions that are members of CARLIGH register individually with the publishers through eIFL in order to gain access (<http://www.elfl.net/>).

TEEAL – The Essential Electronic Agricultural Library.

This is a full text and bibliographic library providing major scientific journals in agriculture. It comes in LanTEEAL with 115 journals and 145 journals on CD ROM – CD TEEAL. Interested institutions register directly with TEEAL to have access to it (<http://teal.cornell.edu>).

DOAJ – Directory of Open Access Journals.

This provides full text, peer reviewed scientific and scholarly journals in all subjects and languages that are published on Open Access. This is a free resource to every one and institutions in Ghana use it extensively (<http://www.doaj.org>).

JSTOR

Under the JSTOR African Access Initiative, full text interdisciplinary high quality journals are made available to not for profit institutions in Africa. It offers over 1000 journals across the human and other sciences, in 48 disciplines. Each institution in Ghana gains access to the journals through its IP Addresses and by completing the JSTOR Network Verification Form. Completing the form will enable JSTOR to ascertain whether one's network is capable of running JSTOR or not (<http://www.jstor.org>).

AJOL – African Journals Online.

This is a service that makes available published research from Africa and also makes such research available worldwide. It is the largest online collection of African published peer-reviewed scholarly journals. It contains abstracts from over 320 scholarly journals published in 25 African countries. Full text of the articles can be obtained through document delivery services (<http://www.ajol.info>).

SIST - Science and Technology information System

This is a multidisciplinary database (<http://www.sist-sciencesghana.org.gh>).

World Bank Publications

This is a development database which features several subject areas (<http://www.worldbank.org>).

GDNET - Global Development Network

This is document delivery service from the British Library for Development Studies of the British Institute for Development Studies. www.blds.ids.ac.uk/blds

It is worthy to note that all the institutions in CARLIGH have access to all the e-journals on subscription and all those available on free basis. Altogether about 20,000 online journals are available to researchers in Ghana.

Impact on Research Output and Dissemination

Access to online journals has great impact on research in Ghana. There are currently a lot of global research results available to local researchers. They use these results to improve upon their own research; to know what others have done on a topic so as not to repeat but rather to build upon or even critique it, or even more to collaborate with other researchers in other parts of the world.

Access to these e-journals has engendered more interest in researchers for increased research so that more research output will be put out to the world, from our country. This also assists greatly in development within the country. The knowledge of scientists and researchers has also been upgraded to ensure accurate impartation to students, who as the leaders of tomorrow will be armed with correct information.

Electronic Publishing Initiatives in Ghana

The research community in Ghana has been exposed to some training to enable them publish their journals online. From 7-9 February 2005, under the auspices of INASP, training was given to some journal editors for this purpose. Some of them were able to start publishing e-versions along with the print versions of their journals. The e-versions were sent to AJOL to be included in the AJOL database. Currently there are 16 scholarly journals from Ghana in AJOL²². Some of these journals are now trying to get indexed in ISI Web of Science.

As far as actual publishing online is concerned, there were two (2) workshops, one held for the Northern Sector in Kumasi from 23 – 24 November, 2006 and the other held for the Southern Sector in Accra from 12 -13 December, 2007. These workshops especially the one held in Kumasi introduced the Public Knowledge Project (PKP) software, Online Journal Systems (OJS) to researchers, librarians, journal editors, potential journal editors post graduate students and IT administrators²³. After these workshops no institution has embarked upon publishing research results online. The constraints have been the lack of infrastructure, need for more training of personnel to do the work and securing the approval of the parent institutions, which has not been forthcoming in some cases because of inadequate advocacy with the leadership of the institution.

INASP quite recently has come in to support a Workshop which included training in the use of OJS to publish journals. This workshop was held from 8 – 10 September, 2008 in Kumasi and it was attended by 20 journal editors of some scholarly journals in the country. The OJS was effectively introduced and several hands on sessions were held. The editors were also given knowledge on how they could get their online journals indexed in high quality indexing services for visibility and also to carry out effective advocacy with the parent institution. It is hoped that with this follow-up training reinforcing what the journal editors already know they will soon start publishing online.

Taking it from another angle, CARLIGH and INASP organized two training workshops recently to equip library and IT personnel in institutions to be able to handle electronic publishing. The first was from 15 - 17 July, 2008 where participants were exposed to Web Design in order to equip them to create and maintain the web pages of their institutions. The second workshop from 2 – 4 September, 2008 introduced the use of DSpace in setting up an Institutional Repository (IR). This IR will host several types of scholarly information which can be searched by everyone. Prior to this DSpace Workshop, from 12-13 June 2007, at a training workshop sponsored by eIFL.net, participants had been introduced to several types of softwares which could be used in setting up an IR. It was after the workshop that participants settled on using DSpace software, hence the September 2008 workshop concentrating on the use of DSpace for setting up an IR.

Training on the use of softwares for e-publishing have been effectively done and it is expected that journal editors, Librarians and IT personnel in the various institutions will put into practice what they have learnt. If these are done then very soon e-publishing will not just be known in theory, but it will be seen on the web pages of institutions in Ghana.

Challenges and Solutions

Several challenges were faced in the process of making e-journals available to the research community in Ghana. Embarking on e-publishing has also not happened without obstacles. The major ones are presented here along with how they were tackled for success.

Getting the management of institutions to agree to commit funds to subscribe to the e-journals was an uphill task. Several sensitizing fora, had to be scheduled with individual Vice Chancellors and also as a group with the Vice Chancellors Ghana (VCG). These meetings paid off because there was determination by the Head librarians of the public universities, who never gave up until success was achieved.

Lack of enough funds to allow for the subscription of several databases constituted a challenge. Databases that were suggested had to be evaluated and the most relevant and affordable ones to the research community were selected for subscription. Since there is a library consortium in place, compromises had to be reached on the types of databases to subscribe to as a group. This meant that some databases very specific to an institution could not be subscribed and the institution that wished to subscribe to that, had to go it alone, which was often very expensive. This brought to the fore the need for more advocacy with Heads of institutions to lobby them to make more funds available for more databases to be subscribed to.

Getting researchers to use the e-journals initially was a problem. This was because most of them did not have the searching skills. Several training sessions in searching the internet were organized for them on one-on-one basis or as a group before they were able to appreciate the vast amount of current scientific knowledge available to be searched. Such trainings are on-going to ensure that they gain the skills. They also had to be debriefed on their long held views, coming from way back to the 1980s, when academic libraries had no current information, that currently academic libraries are better stocked with relevant and current materials than ever before.

The slow rate at which some members of CARLIGH paid their share of cost of subscription to e-journals, made it difficult for renewal of subscription on time to enable continuous availability. This brought in the idea for proposals to be written seeking funding from outside the institutions. Additional funding received enabled the consortium to embark on a forward planning system of having money for a year's subscription in advance. There is therefore no interruption of access to the databases and within the year payments from "slow payers" are collected.

Poor electricity supply and slow bandwidths were also major challenges. Currently most of the libraries have stand by generators and also bandwidths have been increased respectively, this ensuring that there is constant access to the e-journals.

The problem of keeping archival copies of e-journals and adding them to the catalogues and holdings of the libraries is of great concern. For example, as the situation is now, if a user were to request a copy of an earlier published article at a later date it may not be possible for the library to get it. Added to this is the copyright and network security issues that remain unanswered. However, the library community is closely

monitoring the ongoing debate on e-journal archiving, with the hope that some positive developments will emerge soon.

On the e-publishing front, the issues of inadequate training and infrastructure have been the limiting factors. Several persons, who were trained before, later complained that they needed more training in order to be effective. These follow up trainings have quite recently been offered and the participants have given assurances that they are now better equipped to publish their print journals online, or start publishing new online journals, or set up their Institution's repositories.

The setting up of infrastructure for e-publishing which is mainly policy and equipment are being tackled. For some institutions, plans have been laid out for effective advocacy so that they will take e-publishing more seriously. This will include the setting up of a Committee to draw a policy for it, making available funding to acquire equipment and putting in place other infrastructure. Some other institutions have now started putting together policies to guide e-publishing including what is to be published to enable a well structured system, devoid of problems. Again, the institutions have been informed about the equipment needs of e-publishing. Some have made the equipment available while others are in the process of acquiring them.

An issue that has posed a challenge is where the hub of e-publishing will be located in the institution and who will be responsible for maintaining and moderating it. It is a known fact that the source of scholarly information in an academic institution is the Library. Currently libraries have Systems Librarians. The best place for e-publishing to be located in an institution is in the Library with their icons appearing on the Library's webpage. This ensures that the source of scholarly information in the institution will emanate from the same place to prevent unnecessary conflicts in schedule of work, responsibilities and tasks which are detrimental to progress.

There are some concerns from the academia and researchers that seem appropriate to emphasize since librarians also share them. Institutionally backed publishers should try to make maximum use of the current technology to enable research output to be published, quickly and cheaply and also distributed widely for visibility of the researchers and the institutions themselves.

Conclusion

Electronic journals and electronic publishing are modern ways of making research information easily available and also making the researchers visible globally. It also can eliminate plagiarism to ensure that research results put out in the world do add to knowledge.

Looking forward, it is very clear that the factors influencing the scholarly communication process are multi-faceted in nature but are still under control. The control lies in the hands of authors, learned societies, commercial publishers, libraries and the research community at large. One has to accept that no single player can achieve dominance over the other. It is necessary that every player has to satisfy their interests and at the same time continue to promote scholarly communication in spite of technological developments, growth of knowledge, changing user needs, changing means and modes of information transfer. The Internet offers unlimited prospects for publication and distribution of information in digital form. Researchers being the prime producers of knowledge seem to have no choice but to accept the new means of electronic publishing including e-journals. This would serve as an alternative to print journals, but also to reach a large audience quickly.

Libraries have to work out strategies and actively collaborate with publishers to satisfy the needs of researchers and promote scholarly communication. At present, libraries, particularly university libraries, are actively engaged in incorporating electronic media on networked environments (Web pages) to provide much-needed primary research information. Financial pressures have compelled them to form consortia under the elusive banner of resource sharing.

Although publishers have gained supremacy over the technology, two fundamental issues need to be addressed by them. These are copyright issues and the cost of information access

Whether it is in the print or electronic medium, scholarly communication has to retain its scholarly content and purpose so all the players need to adhere to the following principles; allowing scholars to communicate effectively and timely; eliminating barriers and limitations; protecting the copyright interests of both scholars and institutions; maintaining quality by peer reviews and referee systems; reducing costs; avoiding delays in publishing and delivery; and providing tools to help the communication process. Academics, libraries, publishers, learned societies etc., are going to witness many more changes in the new environment driven by the Internet and perhaps with some disturbance in established traditions towards a better scholarly communication system.

E-journals and e-publishing are facilities introduced to Ghanaian researchers in 2002 and 2004 respectively. Today e-journals have become a very important means of access to current scientific information for Ghanaian researchers. They now crave for the addition of several other electronic databases which will be done when funds are available to subscribe to them. CARLIGH is also exploring several avenues to satisfy the cravings of the researchers. E-publishing initiatives since they were introduced have awakened the interests of researchers, librarians and journal editors who have now been trained to carry out the jobs. Institutions have been briefed and where necessary will be re-briefed on the usefulness of e-publishing so that they will enthusiastically look forward to the libraries making good their promises to set these initiatives up. The Libraries are armed with the expertise and they are waiting for the right infrastructure to be put in place. Currently, the chief players – libraries and researchers - are willing and so e-publishing concerns will soon be operating from the various institutions.

Electronic journal availability coupled with e-publishing initiatives are going to catapult the research community in Ghana to stand shoulder to shoulder with their colleagues in other countries in the south that are already involved in it and also from the north. In all these achievements the Library will be seen as the tool or avenue used as well as one of the major players when the story is being told.

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