Access to Research in Cameroon: Potential for the Democratization of Knowledge

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ABSTRACT

The following research has been carried out in order to assess the current state of access to both print and electronic scholarship at 6 universities in the developing nation of Cameroon and to gather information about the perceptions and needs that students, professors and librarians have regarding open access to scholarly resources through the use of the Internet. This has been done in order to discover how open access via the Internet can make a positive contribution to the scholarly lives of people who find themselves victims of the digital divide and the knowledge gap and to promote the democratization of knowledge access via this mode of information dissemination. Using questionnaires, this research asked 91 participants topical questions regarding these issues and discovered that the importance of increasing both access to technology and research literature is appreciated and supported. The questionnaires were prepared by John Willinsky and Henry Kang. Two librarians from Buea University in Cameroon, Kivin Wirsiy and Rosemary Sutcliffe, were hired to distribute, collect and then send the results back to Vancouver, Canada. The results of this thesis will be combined with the analysis conducted by Kivin Wirsiy and Rosemary Sutcliffe to form a joint international publication of the larger project. What was found as a result of this study is both a source of concern and hope. Even though their access to the Internet was restrained and often at their own personal expenditure, the Cameroonians participating in this study were committed to the use and possibilities of this medium to increase their access to academic literature and at the same time they positively anticipate overcoming the currently inferior state of access by the ameliorating capacities posed by online journals both from abroad and, more so among students, from Africa, for their research and teaching.

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Preface

The following research was taken on due to my strong beliefs in democracy, ethics and freedom from oppression in any form. Without these concepts, the world would be in an even bigger state of chaos and inequality. The philosophical and moral underpinnings of this work were the reasons why I chose to do this. In many ways the lack of academic and research information that exists today in developing nations such as Cameroon reminds me of how powerful religious leaders would oppress their citizens by keeping holy scripture from them by writing it in a language that these people could not read or speak. The difference here is that the people involved in this study are being kept from this literature simply because of money. I for one do not believe anyone should have to qualify to read and use research and literature, it should be considered as a common good that all the citizens of this earth have a free right to. It is my opinion that we would progress faster as a species if we shared our knowledge in a synergistic manner instead of competing and protecting ideas with copyright. It is my sincere hope that this project will play a part, no matter how small this may be, in freeing knowledge to the masses who are not presently capable of accessing it because of monetary reasons that exist because of geographic location and unfortunate historical circumstances.

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Chapter One
Introduction

Imagine that a student attends university classes in a forum with about 500 other students. In this class the students have one teacher. While lectures go on, the students listen more than intently because they have no other access to the academic literature that might provide the crucial background to the individual lectures and the entire course too. Access to scholarship for this class equals one book for 500. The teacher reads the text aloud. Perhaps this example seems far fetched but it is based on a true story, one from Cameroon, the country which is the major focus of this study.

This is a study of the access to the research literature available to faculty and students in Cameroon, based on a survey of 91 faculty members, librarians and students at 6 universities in Cameroon. The survey asked the participants about the current state of access to both print and online journals, and sought out their priorities and interests, in an effort to establish what the introduction of the Internet might mean to scholarly communication. The goal of this work is to inform the larger world of the current conditions and aspirations among faculty and students in Cameroon, that the importance of increasing both access to technology and access to research literature is appreciated and supported. Furthermore, an important focus of this work in Cameroon is directed toward helping faculty members and researchers in the developed world understand that their decisions about how to make their work available could make a difference insofar as they select open access as a means of circulating their work, whether through open access journals or through open access eprint archives (in addition to publishing it in non-open access journals).

It should be made clear that this thesis does not attempt to address the full range of development issues that Cameroon faces, but examines the one over which scholars and researchers have the most control, and one of importance for those in Cameroon who attend post-secondary institutions of learning.

Amid current concerns about the state of scholarly publishing, it seems highly relevant to take into account the needs of those scholars and students who have least access to it, while deserving no less than anyone else. At risk is the state of the circulation of knowledge and the contributions of all those with interest, background and talents to contribute.

What was found as a result of this survey was both a source of concern and hope. Although their access to the Internet was limited and often at personal expense, the Cameroonians participating in this study were committed to the use and possibilities of this medium to increase their access to scholarly resources and they look forward to moving beyond the currently unsatisfactory state of access to the greater opportunities posed by online journals both from overseas and, more so among students, from Africa, for their research and teaching.

While the survey tells part of the story in numbers and participant comments, a vivid initial instance can be found by returning to the example mentioned in the first paragraph. Athanasius Ako Ayuk, a doctoral candidate studying Joseph Conrad in the English department at the University of Yaounde as recently as November 2002, points out in an interview in the Dickinson College's newspaper, *Campus News Extra*, to the severe lack of access to scholarship amongst other hardships that Cameroonian students normally can find themselves in when attending university in this African nation.

Imagine you're a graduate student writing your dissertation. You don't have a computer or Internet access. The most recent books you can find on your research topic are 20 years old, and even those are hard to come by. Your adviser is too busy to meet with you. You're wondering if you can afford next semester's tuition because you aren't getting paid for the classes you're teaching and financial aid doesn't exist. (Campus News Extra, 2002)

Ayuk points out that the above situation is quite the norm. This means that access to scholarship in both print form and electronic from are limited. In his case the print material available for his dissertation was so old that he had to stop writing and researching his topic in 2000: "He wrote a preliminary draft of his dissertation, which examines the human condition in Joseph Conrad's novels, two years ago. But without access to current literary criticism, he couldn't move forward" (Campus News Extra, 2002). And he could only continue this upon arriving in the US where he was then able to access the extraordinary and ubiquitous amounts of scholarship regarding his dissertation subject that were available there.

In this situation, his progress was directly stopped due to the knowledge gap and the digital divide. A lack of access to current scholarship in print form or the ability to access journals online due to the unavailability of technology to allow for this can be blamed. As Ayuk states of the Cameroonian students predicament, "The situation is quite desperate for them." He goes further in his explanation of this desperate situation and explains how poor access is and also comments on the difference of availability of scholarship at a US college in comparison to schools in Cameroon. "Their classes can have 500 students and none of them have any books. The professors read aloud the information they want students to learn. [When they get to Dickinson,] these kids hit the ground running. This is an extraordinary opportunity for them to gain access to US

resources. It's a tough and lonely road sometimes, but they thrive here" (Campus News Extra, 2002).

Here it is apparent that many students in Cameroon do not have text books. Their access to scholarship in this situation described by Ayuk above equates to there actually being no availability of academic literature save for the one copy that a professor has and must read aloud to 500 people. One book is being shared with 501 people in this case.

Ayuk's research was limited in Cameroon by the fact that he did not have access to any as he puts it, "state-of-the-art criticism." He was able to do a certain amount of writing and research in Cameroon. However, his experience studying at a school in a wealthy nation like the US has made all the difference. As he says of his own experience in Cameroon in comparison to the US, "In the past, my scholarship was limited because I had no access to state-of-the-art criticism. I could do a certain amount on my own, but I needed [current scholarship] to give credence to my arguments and make sure my theories were tenable. Even in the short time I've been here, my thinking on my P.H.D. has changed totally."

Ayuk is one student whose account exemplifies the poor state of access to scholarship in Cameroon and how this negatively effects academic pursuits in this country. He also reveals that his situation is not unique. In Chapter 4 of this research, the results of this study are portrayed in such a manner as to reveal detailed and specific concerns regarding the state of access to scholarship in Cameroon in addition to considering the realities of instructors and librarians in addition to students like Ayuk from 6 of the major Cameroonian universities.

In a situation like this, open access could potentially remedy a very serious lack of academic information. Courses could be created based on relevant online materials. As such students could get copies of the articles at the cost of printing them out instead of having to buy an entire text or suffering with nothing at all because it is not even possible to acquire such a piece of information. Of course in order for this remedy to work, there are problems to be dealt with.

In an ideal world where open access to research would be the norm, anyone looking for research or academic information about a certain topic would be no more than a few key strokes away. One could sit down at a computer, access the Internet and upon entering the proper search terms via an open access system, such as the one being created and implemented by the University of British Columbia's Public Knowledge Project, be able to read and print out research publications relevant to his or her needs. Even now it is possible to do so in a limited manner. One can, at times, find free access to scholarship via search engines such as Google or Yahoo too. In my own research for this project I was able, at times, to find research documents and information relevant to this project. The bibliography for this work is a testament to this. Open access also has other benefits too.

With the current and ongoing "serials pricing crisis" all nations can benefit from this method of information dissemination:

The serials pricing crisis is now in its fourth decade. We're long past the point of damage control and into the era of damage. Prices limit access, and intolerable prices limit access intolerably. Every research institution in the world suffers from intolerable access limitations, no matter how wealthy. Not only must libraries cope by canceling subscriptions and cutting into their book budgets, but researchers must do without access to some of the journals critical to their research. (Suber, 2003)

In addition to this, it makes it possible to share information, publish information and gain exposure in academia amongst other benefits such as the ability for peoples living in developing nations to join into the global academic community vis a vis the Internet's capacity to function as a communicative tool and open access's ability to cut costs.

Open access is not the answer to all of our problems in making available academic literature to everyone. With this idea comes many barriers and hurdles that need to be overcome if open access is to achieve a positive contribution to the world's academic populous as a technique capable of disseminating important and sometimes crucial ideas -- as is the case at times with medical journals and various scientific journals -- to all parties interested. Nonetheless, it is an idea that does offer inklings of hope and some positive solutions to part of the problem of accessing scholarship.

1.2 Open Access: A Glimmer of Hope for the Developing World

One of the primary hurdles to be overcome if open access is to achieve the ability to provide scholarship to the academic world in both rich and poor nations is access to technology. This problem is particularly a barrier in countries from developing nations. This is true for the simple reason that for open access to work, it needs the necessary ICT's to function. In other words if an institution is not hooked up to the World Wide Web or Internet and if this institution does not have computers or ISP's then it naturally can not get online to access free journals that exist in electronic from. Likewise if students and professors are unable to access the Internet via the appropriately hooked up computers because not enough of them exist or because Internet access fees are too expensive then there is also a problem. This lack of access due to an absence of

technology is often referred to as the digital divide: the division between the haves and the have-nots where wealthy nations have the technology and developing ones do not.

Open access publishing has the potential to disseminate academic information to those who need it and especially those who find themselves in a deficient situation regarding access to scholarship due to costly serial subscriptions (see Appendix I for definitions of open access). This lack of access to scholarship in developing nations is referred to as the knowledge gap. The digital divide and the knowledge gap are two of the main hurdles that developing nations find themselves facing. In addition to these problems, the marginalization of researchers and low visibility of their academic work are also problems that the academic population of developing countries face.

Thankfully, there exists potential and hope to address these problems with open access. And additionally it is also encouraging that there are some strong advocates of this idea from well known institutions who have taken the time to explain how this type of access can benefit those who are less fortunate. Harold Varmus, the director of the National Health Institute believes that open access systems, such as PubMed Central, are capable of helping solve ongoing difficulties because of the way in which these systems are capable of democratizing access. Financial issues disappear in addition to problems of location and distance (1999). In other words, it will not matter if a poor scientist from a developing nation is not capable of being in a certain place to access research or for that matter disseminate his or her own. Open access systems solve both of these problems. The restraints that time, space and cost have on print journals vanish with open access publishing and the systems created to support it. In addition to this, poorer nations will be able to access scientific and scholarly journals just in the same way wealthier nations do

for the same reasons Varmus offers. And this is democratic dissemination and access because the wealthy *and* the less fortunate become equals.

For the purpose of this study, developing nations are considered for the most part and the country of Cameroon is the main focus of data collection and analysis. The literature review looks at the state of access to technology and scholarship in developing nations and particularly Africa. One of the reasons for this is because the lack of scholarship in developing nations is severe and the lack of technology is also very problematic while at the same time being far from abundant.

If one compares the access that a Canadian university has to one in Cameroon it is very obvious that the situation is terribly worse in this African nation. As a testament to this I can speak of my own experience as a researcher and student at the University of British Columbia. I myself was able to access computers and scholarship online both on campus and at home with ease. In fact, my bibliography is essentially made up of sources that are open access or at least available electronically. In comparison, as this study reveals, some universities in Cameroon are not connected to the Internet and can't access any scholarship online. Some of the libraries do not have any subscriptions to online journals or the ones that are available via open access (free).

In this light, the problem of accessing scholarship in the developing world is far worse and more serious than here in Canada or other wealthier nations. If open access can make a small difference for the developing world -- one that will make available essential scholarship for students, researchers and professors -- then open access is something which needs to be promoted and researched in order to discover how best it can serve those who are less fortunate and in need.

As the literature review reveals in Chapter 2 of this thesis, the lack of technology and scholarship in developing nations has been addressed by many important organizations, institutions and publishers of academic information. In addition to this they remark upon open access and its potential to solve and remedy many situations that arise due to a lack of technology and literature. Currently there are initiatives which exist that are being implemented in order to overcome the hurdles faced by developing nations regarding this subject. In order to establish the current needs of developing nations, the current initiatives that exist and what the potential open access has to work as a remedy for the aforementioned hurdles that exist in the South, the literature review in Chapter 2 of this thesis is divided into the following sections for the following purposes.

Essentially the three sections of the review encompass the foremost issues and initiatives that define and discuss open access to scholarly information in countries from the developing world. Each part looks at the details of an important aspect of this issue. Part one reviews the current state of access to scholarship in developing nations to portray the existence of knowledge inequity and the state of inequality these countries are in when compared to wealthy countries like Canada that have far superior access and visibility. The second section reviews the most important reasons why this deficient state of access is occurring. Furthermore, it defines and exemplifies some of the major obstacles that balk improving this poor state of accessing scholarship. The last part reviews the most important initiatives that presently exist – initiatives that currently provide open access to academic and research scholarship for nations of the South. These initiatives have been created, partially anyway, to remedy the difficulties and solve the deficient state of access to academic literature that presently exists.

The literature review in the following chapter exposes the current deficient state of access to technology and academic information which exists in the developing world. It also reveals the link between technology and information and how if one is to benefit from open access one must first have the technological means to do so. Furthermore, it identifies the major organizations, institutions, and publishers that are advocates of open access and reveals why and what they are currently doing in this regard. It also identifies and defines the key reasons why open access exists as a potential solution to the lack of access to scholarship in the developing world. Hopefully with the information discovered in the literature review a proper picture of the current state that developing nations find themselves in provides the reader of this research with an adequate background to situate the primary focus and thesis of this research which revealed the following.

With the majority of Cameroonian students and instructors accessing Internet technology at public places instead of at their respective universities whilst they also rate an increase to accessing the World Wide Web as the most important priority for their libraries, Cameroonian professors and pupils can benefit from an increase in access to technology at their respective schools because this would allow them to have greater and easier access to the ICT's which could in turn help them to solve, in part, their serious lack of access to academic research and scholarship via open access publishing – something that the majority of students, instructors and librarians from these universities recognize as an important issue that relates to their own scholarly purposes such as increasing access to both African and overseas journals and improving opportunities for publishing overseas and new African journals.

Finally, I would like to voice and clarify my own sentiments for doing this project because the focus of this study is in many ways based upon these philosophical underpinnings. Ethically I believe we all have a right to access scholarship. One should not have to come from a certain place or be in possession of a certain amount of wealth in order to qualify to be able to read the academic ideas of this world. It should have nothing to do with qualification. Like many others who are involved in this issue, I strongly believe that this information should be available to anyone who wishes to access it because it is the democratic right of each and every citizen of this planet to do so.

To privilege such information and make it available to only the select few capable of affording the technology and other costs currently needed to access the world's most prestigious journals is in my mind wrong because this information is at times capable of solving serious issues – when it comes to specific types of medical and scientific research -- that people face regarding health and survival. But I also believe that people strongly benefit from the information and ideas that come out of the humanities. One can understand other cultures, religions, philosophies and political beliefs through the studying of ideas from foreign nations. And if we are to ever truly understand each other and coexist peacefully on this planet, certainly sharing our countries scholarship from the humanities in general is one step closer to tolerance, compassion and peace.

Chapter Two
Literature Review

Any effort to increase access to academic and research information in developing

countries using online forms of electronic communication like the Internet is an issue full

of much promise and a variety of challenges. When Harold Varmus, director of The

National Health Institute (NIH) states that electronic publishing in the medical sciences

provides "open access, rapid and wide dissemination, reduced costs and flexible

publication formats"; among those who will benefit from such publishing initiatives, even

if they are not the main intended audience, are developing countries (1999). Yet while the

Internet has the capacity to deliver a much greater portion of the research literature than

has otherwise been available to developing countries: the digital divide, the knowledge

gap, and the marginalization and low visibility of academic information produced by

scholars and researchers from developing nations are some of the barriers southern

countries face in regard to this topic. In Varmus' view, new systems for open access such

as PubMed Central, an NIH initiative for the electronic dissemination of life sciences

research, are a democratic force:

> [Open access systems] must be developed with concern for the ambitions of
> trainees, little-known scientists, or scientists at less prestigious institutions or
> foreign sites. Clearly, electronic communication has enormous advantages for
> people in all of these categories, because it is a democratizing force that makes
> distance and wealth nearly irrelevant. (1999)

As I will describe below, a number of initiatives use electronic publishing to make

access to research information free for developing countries and/or free for

everyone globally. There are also many advocates of open access in the academic world

in addition to organizations with varying vested interests writing about the positive

benefits that it provides. This is a review of some of the major issues and initiatives

relating to open access to scholarly information in developing countries. It is divided into

three parts. Part one looks at the state of access to research literature in developing

countries in order to explain and exemplify the existence of a knowledge gap and the

state of inequality these countries are in when compared to developed nations that have

far better access and visibility. Part two is a review of the major reasons why this poor

state of access is occurring and points out some of the major hurdles that stand in the way

to improving it. The third and final section reviews major initiatives that exist which

provide open access to academic and research literature for developing nations. These

initiatives exist, in part, to overcome the hurdles and solve the poor state of access which

exists today.

2.2 The State of Access to Research Literature in Developing Countries

In reviewing the current state of access to research literature that developing countries

have, one comes to the realization that there exists a great knowledge gap or state of

knowledge inequity when comparing the access that African researchers and scientists

have to a wealthy nation like the United States. As Levin (1999) points out in her report

about using information and communication technologies in the health sector

in Sub-Saharan Africa , on average, a medical library in the US may have about 3000

journals compared to about 30 that many have in Africa.

In this light, African scientists are marginalized because they do not have equal access to academic information such as medical or scientific research. Furthermore, they are marginalized because their own work is not accessible. For example, Christopher Zielinski found that Western indexing services such as Medline and The Science Citation Index cover about 3000 journals. Of these 3000, 98% came from the developed world (Zielinski, 1995). As Zielinski puts it, "this is a starting point for the vicious cycle affecting Third World literature: journals that are not indexed are rarely stocked by librarians, hence rarely cited by authors, and hence rarely indexed". If their work is not indexed, it is very difficult for researchers to find and use it. Due to circumstances like this, scientists and researchers outside of the developed world tend to be left out and on the fringe.

According to Cetto (2000), developing countries, which make up 80% of the world populous, only contribute 10% of registered ISSN titles. Scientific journals from developing countries have poor distribution and are "under-represented in the international databases and indexing services." It is important for developing countries to make their scientific work available in order to, as Cetto explains, contribute to "their own scientific development and to international science". Although, the digital divide, the knowledge gap and marginalization exist, there are initiatives using ICT's to communicate scholarly information in existence that can, as Cetto explains, be used as models "of good practice to be promoted".

According to Adam, visiting associate professor of information science at Stellenbosch University in South Africa, "Internet access is the prerequisite for scientific development in Africa" (1999). In addition to this, open access to scholarly journals and

research information benefits developing countries because information coming from developed nations has been repeatedly identified as critical to development and as a human right:

> Now we are at the start of the information age, and we understand better the importance of information. The recent millennium assembly of the United Nations emphasized this in its statement on the right of access to information and communication. Information underpins the learning, research, and debate that drives a country forward. Access to information is essential for describing and understanding the deficiencies of the present, building visions of a better future, developing practical ways to achieve those visions, and educating and inspiring those who must make the future. Information empowers, and those who work with information must realize that its flow, like good communication, must be two way. (Godlee, Horton and Smith, 2000)

Tan-Torres (2000) and Smith (1998) explain that the gap of information between developed and developing countries is increasing with the introduction of information technologies. In 1998 less than one million people had access to the Internet in Africa – a continent with a population of 700 million. Of the million people with Internet connectivity, 80% lived in South Africa. Of the remaining 20%, 1 out of every 5000 people had access as compared to 1 out of 6 in the US and Europe (Lown, Bukachi and Xavier, 1998). This gap exists within countries and between them too. In addition to this, according to Tan-Torres (2000), the "digital divide is more dramatic than any other inequity in health or income." This, in Tan-Torres' view is depressing considering the fact that ICT's "have been hailed as one of the solutions to these inequities." An example of this inequity regarding information access is the existence of medical libraries in Sub-Saharan Africa that do not have access to any current research journals while scientists in developed countries such as the US and Britain can access "hundreds of journals and other databases from their homes and hospitals" (Godlee, Horton and Smith, 2000). It is obvious that access to academic research literature by citizens from the

developing countries of our globe is by no means occurring at an equal level to wealthy, developed nations. This state of affairs occurs because of a variety of problems. These problems are obstacles that must be defeated if the current state of knowledge inequity is to be improved.

2.3 The Knowledge Gap and the Digital Divide

The major hurdles that exist such as the lack of access to technology and thus a lack of ability to access scholarship online are a part of the reason why the state of access to academic literature in developing nations is so poor and inadequate. These problems are especially a part of the reason why this state of knowledge inequity pervades the countries of the South. Abdoulye Wade (2003), President of Senegal, describes global society as being split into two groups: the North and the South. In his opinion, he describes this divide as having occurred because of a "large time lag between economic and technological evolution". The North is the wealthy group with the technology and access to all the positive attributes that ICT's (Information and Communications Technology) have to offer. The South is the impoverished group without access and as such the countries that make up this group are excluded from the multitude of benefits that are fostered and provided through the use of technologies like the Internet for example.

As he puts it, the North and South "communicate less and less, with the risk of no longer being able to communicate at all". It is this digital divide or "gap" which as Wade states, "brings with it the danger of isolating certain peoples, those in Africa in particular". And finally it is worth noting the irony of this that Wade expresses in his own

words: "It is paradoxical and ironical that the continent which invented writing would -- at the end of a process which it initiated -- be excluded from universal knowledge".

Wade offers up the notion of digital solidarity in the world, one where the world becomes conscious of the dangers of societal divisions and due to this awareness overcomes this plight by making available the information that exists in the libraries of the world "to every corner of the earth, in the North as well as the South".

This major hurdle, often referred to as the knowledge gap is, according to Persaud, (2001) increasing because of what he refers to as a "knowledge economy" -an economy which is widening the already existing distance between the North and South. He points out that while a researcher in the North can potentially access "thousands of journals" researchers from developing nations do not have the possibility to access this volume of scholarly information.

Furthermore, he estimates that the knowledge gap is about 10 times greater than the difference in incomes between the developed and developing world. Thus, there exists a great inequality based on the lack of ability to access information. One can easily imagine this unfair playing field simply by reflecting upon a hypothetical example that Persaud provides about two researchers: one is from the North and the other the South. They are being asked to write a journal article about exactly the same topic. The northern scholar has access to thousands of current online journals, accessible at home. The Southern scholar does not have this opportunity. In this hypothetical but very possible situation, the disparities are blatant.

In addition to this, "the problem is not simply a lack of phone lines and computers" says Willinsky (2002). "The gap between haves and have-nots is just as much

a matter of access to well-organized sources of knowledge." Willinsky exemplifies this by asking us to consider the critical importance of open access to the e-journal entitled *British Medical Journal* to the University of Zimbabwe. This university according to its medical librarian had to cut back its journal subscription "from 600 to 170 due to rapidly escalating subscription costs" (Nagourney, 2001). This journal, according to the librarian "has won our hearts because it is free."

In light of this problem, Willinsky points out, efforts have been made by various scholarly societies and publishers to create open access to research and scholarly knowledge. This is an important example of how efforts can be made to shrink the knowledge gap. In fact, as Nagourney states, "six major commercial publishers of academic journals…will make one thousand of the world's top medical journals free or deeply discounted for developing countries" (Nagourney, 2001: Peterson, 2001). The Health InterNetwork Access to Research Initiative (HINARI) has since become a much larger initiative, one that is outlined in further detail on page 28 of this review.

Like Willinsky, the secretary general of UNESCO, Koichiro Matsuura (2001), also points out that accessing networks is not the only hurdle when it comes to overcoming the existing knowledge inequity. It is the content of the information that needs to be readily available. Matsuura explains that in order for a country to develop, it must have access to information that is produced by governments and public funds. Everybody stands to gain if these types of information are made available to the public domain via the Internet.

Obviously open access to scholarly information is not the entire solution to the plight of developing nations faced with an unequal amount of information and

technology. However, ICT's have definitely increased the ability of the world's population to get information and communicate it to others in almost every country on this planet (Matsuura, 2001). Furthermore, citizens have a democratic right to access government and public information; this type of information, according to Matsuura, is a fundamental aspect for human development and the existence of democracy in a society.

As Matsuura points out, UNESCO is committed to the "free flow of information and access to knowledge is part of its mandate". It is fair to say that open access is one very possible way to achieve, in part, UNESCO's mandate. The free flow of information and access to knowledge do in fact exist as opportunities for people who can get onto the Internet and search amongst some of the already existing online and open access journals. These opportunities are a positive influence.

According to Adam (1999), information and communication technologies are responsible for causing a change in the way that the publishing and research of scientific information is taking place in Africa. This change is occurring in a situation with many barriers. Social, political, economic and infrastructural hurdles put Africa's use of ICT's very much behind more developed nations. The promotion of scientific information and publishing in Africa has many positive benefits according to Adam and if these benefits are to become a reality, ICT's must play a role.

Adam specifically points out the necessity of using web-based information systems (WIS). These systems that work in conjunction with the Internet provide a plethora of "Internet tools" that can be used to promote and enable access to the communication and publishing of scholarly information. In this article, a useful list of tools is provided: e-mail, discussion lists, file transfer protocols, the World Wide Web,

and the deployment of Intranet and multimedia and web authoring. We learn that all of

these tools can be used to improve the publishing and communication of scientific

information for African scientists while at the same time costing very little for "low-cost"

desktop computers and Internet connection fees. The use of the computer has, according

to Adam:

> Already reduced the drudgery in primary publishing –copying, retyping drafts and
> retyping finals. (The) Internet has dramatically reduced ever-increasing delays
> and inadequate communication in the peer-review process and in researcher-to
> research contact. Before wide spread use of the Internet, a paper sent by mail to
> an institution in former Zaire (now Democratic Republic of Congo) or Morocco
> from Ethiopia could easily take over a year. (1999)

In addition to increased communication and publishing, ICT's, according to

Adam, can be used to foster a connection between universities, schools and research

institutes by using databases that enable a sharing of knowledge. Adam wrote this article

in 1999 and now, four years later in 2003, there exists many examples of open access to

academic information which offer a vast sharing of knowledge so long as Internet access

is available. In lieu of the aforementioned problems which are obstacles that balk open

access and, in part, cause the current state of knowledge inequity in the South, there are

promising initiatives which exist that attempt to solve this predicament through the use of

the Internet and both the ideological and pragmatic solution of open access.

2.4 Overcoming Gaps and Divisions - Open Access for Developing Nations

Presently there exists a number of promising and successful initiatives aimed at

overcoming the gaps, divisions and current state of marginalization that developing

countries must endure regarding access to research literature. A good example of how

open access and open archiving of scholarly journals is being used to positively benefit

developing countries such as those in Africa is an eprint archive known as arXiv Eprint Service. According to Chan and Kirsop (2001) this eprint archive allows free access to research papers largely in high energy physics, mathematics and computer science. It receives over two million hits a week, a third of which come from outside the US. This online and open access archive, according to Arunachalam (1994), is very useful to researchers from institutions that would otherwise not be able to access this information because of social and economic factors.

In addition to arXiv Eprint Service, four additional initiatives exist that further exemplify the positive usage of open access: "The appearance of PubMed Central, BioMed Central, and eprint servers at the *Lancet* and *BMJ* make it easier for those from the developing world to bring their research to the world's attention. BioMed Central also offers free technical support and hosting to people wanting to start new electronic journals or to move existing journals to the web" (Godlee, Horton and Smith, 2000).

In addition to this, Godlee, Horton and Smith point out additional open access initiatives that disseminate and exchange health information. Three examples of such efforts are African Journals Online, the Scientific Electronic Library Online, and Bioline International. African Journals Online is an INASP initiative that also offers access to information from other academic fields such as the arts and social sciences (INASP, 2003a).

As described on their website, African Journals Online (INASP, 2003b) offers access to certain journal articles in an open access format such as the Ethiopian Journal of Health Development. The site also makes available abstracts and tables of contents to many African journals in order to hopefully make them more visible. The articles listed

with the abstracts can be ordered for a fee. Whenever possible, links with open access to full texts are provided. This initiative is one example of how it may be possible to promote awareness and visibility of academic information in developing nations by using ICT's in the form of the Internet.

INASP also has an initiative called the Programme for the Enhancement of Research Information (PERI). Of particular interest to the issue of open access to academic research is their listing of other free and open access online journals and databases. At this site (INASP, 2003c), a long list of other initiatives are described with provided links. At the time of the writing of this review, there are over one hundred available sources to academic information online at no cost.

AGRIS is another online and open access initiative which disseminates scientific information related to agriculture. Countries from all over the world put scholarly information related to agriculture here. This international information system is an open access initiative created by the Food and Agriculture Organisation (FAO) of the United Nations. As stated on their online facts sheet (FAO, 2003a), "One of the main reasons for AGRIS' existence is to encourage the exchange of information among developing countries, whose literature would not be covered by other international systems". Furthermore, one of the FAO's primary tasks is to help developing nations reach the objective of becoming self-sufficient in regards to information management. This is done through WAICENT (World Agriculture Information Centre).

WAICENT includes open access to the Food and Agriculture Organisations databases and information systems. Thousands of publications about numerous topics are available such as farming systems, fisheries, food security, rural and social development

and many more. This information is provided free of charge in an attempt to combat hunger with information. WAICENT is the FAO's "strategic programme for improving access to essential documents, statistics, maps and multimedia resources to millions of users around the globe" (FAO, 2003b).

A final example of the FAO's use of open access to research information is its recent launching of a new country website for Gambia. This country, according to the FAO is one of the poorest countries in the world and ranks 160th out o f the 173 mentioned in UNDP Human Development Report from 2002. This site contains open access publications amongst other information that look at the diversification of agriculture and the development of rural areas. These FAO activities work in agreement to a strategy to fight poverty by the Gambian government (FAO, 2003c).

Bioline International (BI) is an initiative which specifically aims at providing greater access to research journals from developing countries in order to reduce the knowledge gap from South to North. Thus it aims at providing developing nations a place to publish journals so that they can be seen and accessed by the world. According to Bioline International, "BI's goal of reducing the South to North knowledge gap is crucial to a global understanding of health (tropical medicine, infectious diseases, epidemiology, emerging new diseases), biodiversity, the environment, conservation and international development" (Bioline, 2003).

Presently 15 of the journals available here are open access and BI is currently working with publishers and editors to get more journals published here with free access. Like BI, there are other initiatives which exist online and in an open access format that

mirror its use of the Internet as a means to providing open access to academic and scientific information.

Another initiative is The Open Society Institute's Budapest Open Archive Initiative (BOAI, 2002). This initiative uses the Internet for "public good" by honoring the tradition of the "willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment". The Internet comes into play by its ability to act as the medium or vehicle that can carry this information to others on a global scale. It is the view of this initiative that getting rid of the walls which balk accessibility to scholarly information "will accelerate research, enrich education, share the learning of the rich with poor and the poor with the rich…and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge" (BOAI. 2002). In this light, the marginalization of scientists decreases if they have the ability to publish their own research free of charge and have it placed online for others to access at no cost.

Initiatives such as BOAI and BI, to name two of many existing initiatives, are examples of electronic publishing. This type of publishing creates a unique opportunity for countries that are in the development stages to promote and advance their communication of scientific information (Packer, 1998).According to Packer, the networking of information technologies, specifically the use of desk top computers and the Internet, are increasingly becoming more and more available in developing nations. In fact, as he states, "this is already true for all major universities and organizations that deal with scientific information".

In addition to this, Packer states that this is already the case for every major university and organization that uses information of a scientific nature. In Packers view, electronic publishing offers new challenges and possibilities when it comes to the communication of scientific information. These challenges and possibilities surpass the reproduction and dissemination of existing hard copy journals into an electronic format. It is this scenario that is of particular relevance to developing nations where as Packer explains, "the overall process of scientific information communication faces several limitations and barriers" (1998).

One of the main barriers that comes to bare on the majority of scientific journals that come from developing nations is "the limited accessibility and visibility they are exposed to." Like Cetto (2000) and Zielinski (1995), Packer additionally addresses the issue of indexing when he points out that only 12 Latin American and Caribbean journals are available in the index of the Institute for Scientific Information (ISI) and 45 in a database entitled MEDLINE. It is Packer's view that this small number of journals that are available "represents one of the most serious barriers for the advancement of scientific communication in developing countries". On the other hand, Packer indicates that even though this is a barrier, examples exist of national and international journal indexes that include ones from Latin America and the Caribbean such as LILACS which indexes 550 journals from this region relating to the health and sciences.

In addition to these circumstances, Packer explains that scientists from developing countries face other barriers. One of these is that scientists are often forced to get their articles published in ISI in addition to other international indexes. This, in Packers view creates a vicious circle that disfavours journals in developing nations that are not referred

to by these indexes (1998). A second barrier is the situation where articles published by scientists in journals from developing nations do not have an impact because the articles are not paid attention to. This occurs on top of lack of visibility and access. Thus, as Packer explains, articles published in journals that are from developing nations can end up being disregarded because the criteria for evaluation only counts when the article gets published in a journal from a developed country.

Packer's article offers the SciELO project as an example of "an articulated movement to address the scientific electronic publishing in developing countries". This project is a formally entitled the Scientific Electronic Library Online. FAPESP coordinates this; it is a governmental foundation that supports scientific research. In addition to this foundation, the WHO office for the region of the Americas known as the Pan American Health Organization is also a partner. There are also a group of scientific editors from Brazil that are a part of this partnership.

It is the methodology of SciELO to utilize information and technology in order to solve the most difficult barriers of access to information, visibility of this information and the issue of evaluating journals of a scientific nature specifically relating to developing nations. SciELO pays particular attention to these issues in regards to the Caribbean and Latin America. SciELO is yet another example of an initiative put into motion to overcome disparities and barriers which exist between the North and South regarding the information gap and digital divide.

In a report on the development of the SciELO-Open Archives Data Provider Server, Marcondes and Sayao (2003) state that SciELO's role is important in the sense that it facilitates the global dissemination of both scientific and technical literature

coming from developing nations. In lieu of this, the visibility of this information is increased because without SciELO, this literature would simply be visible inside the developing nations that produced it.

In addition to the ScieELO project, other initiatives exist which also try to facilitate access to academic knowledge through the use of ICT's. The Public Knowledge Project (PKP) is an initiative which is funded by the Canadian government. It is situated in Vancouver at the University of British Columbia. This project explores the potential and possibility for using new technology to improve the value of academic information publicly. Part of the investigation of this project involves studying the technical, economic and social aspects involved in using "online infrastructure and knowledge management strategies to improve both the scholarly quality and public accessibility and coherence of this body of knowledge in a sustainable and globally accessible form"(PKP, 2003).

The Public Knowledge Project's principal investigator, John Willinsky, has visited countries such as Kenya and South Africa to discuss open access to research and the development of research capacity at research institutions and universities in these countries. According to Willinsky (Newwindpress.com, 2003), access to knowledge is not increasing with the advancement of information technology. As an example of this he points out the difference in journal subscriptions at the Agriculture University in Bangalore from 1956 and today. It has decreased from 1000 to 600. This is due in part because large publishers of journals have made it very costly to access this knowledge.

Willinsky points out that there is a limited amount of online academic papers available online for free. The Public Knowledge Project is creating software that places academic journals online at no charge for the host or reader. (Newindpress.com, 2003)

Although Willinsky believes that open access publishing's contribution to post-secondary education will be small. He points out how it is an easy way to improve the quality of education without hiking up costs (2003b). In addition to this, Willinsky speaks of research literature as a public good -one that can be used to improve the human condition:

> And yet, from a human rights' perspective, insofar as this research literature is a public good intended to better the situation of humankind, the question of its use is not at issue. No one should have to earn the right, or prove themselves worthy of taking advantage of knowledge that was produced in their collective name. If only a few initially take advantage of our efforts to increase the open access, we still all stand to benefit by this increased circulation of knowledge. And so it seems particularly short-sighted, if not churlish, for researchers who have long had the advantages of relatively complete access to the research literature, to show so little interest in increasing the standard of openness for research publishing (2003b).

Like Willinsky's belief that knowledge is a good which is intended to be used to better humanity, six publishing companies of biomedical research – Blackwell, Elsevier Science, Harcourt Worldwide STM Group, Springer Verlag (Bertelsmann), John Wiley and Wolters Kluwer International Health and Science recognize that knowledge (here in the form of biomedical research information) can better humanity because as they put it, this biomedical research information is something which can be seen as essential to the developing world in regards to health improvement. As such, these six publishers began an initiative to provide access, and in some cases free access, to what is deemed primary biomedical information for the academics and researchers of developing countries.

Launching the Health InterNetwork Access to Research Initiative (HINARI) in September of 2000 has been done in response to UN secretary Kofi Annan's request and the additional request of Dr. Gro Harlem Brundtland who is the Director General of WHO (STM, 2003) to get the private sector involved in partnerships to improve upon health in developing nations. In regard to this initiative, Brundtland states:

> As a direct consequence of this arrangement, many thousands of doctors, researchers and health policy-makers among others will be able to use the best-available scientific evidence to an unprecedented degree to help them improve the health of their populations. It is perhaps the biggest step ever taken towards reducing the health information gap between rich and poor countries (WHO, 2001).

In addition to this, these six publishers are working in conjunction with WHO to provide complete access to biomedical journals via the Internet. These publishers believe that access to this research information is one of the very important aspects of developing countries for improving health in addition to being a hurdle. They are open to working with governments, international organizations and other interested parties in order to discover ways to open up access to this specific kind of research information. This initiative is intended to be a benefit for the research, academic and other interested organisations of the developing world.

As of January 2003, this initiative was made up of over 20 publishers providing access to over 2000 medical journals for free or nearly free to a total of 43 new countries in addition to the already 69 countries that were already using the service. Access is free to countries that have a GNP that is less than $1000. For countries with a GNP of $1000-3000, a reduced fee is offered (HINARI, 2003).

Like the HINARI initiative, Oxford University Press (OUP) is offering free access to most of its online journals or at least reduced prices to developing countries. This offer

is made side by side with the initiatives of INASP and WHO. OUP has two country lists, those on list A have free access and those on list B get reduced subscription rates. This initial offer is valid until the end of the year 2004. Criteria for qualification is set out by WHO, The World of Learning, The World Bank and the UN's development programme (OUP, 2003).

A final but by no means the last initiative out there that promotes open access to academic research in developing nations is the Lancet Electronic Research Archive. The Lancet is committed "to making educational resources accessible to clinicians in resource-poor countries". Authors are able to self archive research regarding medicine specifically about developing countries. E-prints are peer reviewed and access to the Electronic Research Archive (ERA) is unrestricted. They wish to have an international health library that is public and searchable online (The Lancet, 2003).

2.5 Conclusion

The present state of inequity regarding access to academic and research literature in developing countries, in comparison to the developed world is a problem which has caused a knowledge gap between the North and South. This problem of knowledge inequity, in part, stands in the way of the progress and development of developing nations. Overcoming the lack of access to this literature can only take place once the major hurdles are overcome. The major obstacles of the digital divide, the knowledge gap and the marginalization of researchers are in part being dealt with by a large number of initiatives that demonstrate the benefits of open access to research literature via the Internet or its equivalent.

Although a number of initiatives provide open access to research literature, the majority of these journals deal with health and science. This type of information is crucial for the welfare of peoples living in developing nations but one does not see many examples of open access to other types of scholarly information and research such as in the social sciences. For many advocates of the developing world, information is a fundamental right and that which is needed for progress and development. This kind of information is deemed essential for development and progress. As such it is important that all scholarly literature be made openly accessible.

Information technology has widened the information gap between the developed world and the developing world and the digital divide has been deemed "more dramatic than any other inequity in health or income" Tan-Torres (2000). Access to scholarly information via this missing technology is one of the ways to overcome this information gap found in developing nations. With the proper technology open access to ejournals exists through various initiatives.

As pointed out earlier, advocates of developing nations point out that in order for progress and development to take place, information must be able to be freely accessed. Both John Willinsky (2002) and Koichiro Matsuura (2001) agree that it is not simply a matter of being able to access a network or to put it another way get more phones and computers. Assuredly developing countries need more phones and computers but open access to academic literature and crucial sources of knowledge and information is also just as much a part of the problem.

The benefits of open access help both developing and developed nations. As Varmus states, the "democratizing force" of electronic communication is as such because

it makes any monetary concern or issues of distance practically irrelevant (1999).
Countries that can not afford to pay for expensive journal subscriptions become less
disenfranchised when they can access knowledge publicly via electronic means.
Fortunately, there are many promising initiatives already in existence which are making it
possible for the have-nots to have. Although the state of knowledge inequity is drastic
and ongoing, one can only hope that over time more initiatives and players will come into
the picture to help remedy a problem which can and has been deemed a fundamental and
democratic right to access knowledge freely –knowledge that is needed for the
development and progress of poor and disenfranchised countries.

Finally, it is important to point out the relationship between access to technology
and accessing academic scholarship via open access initiatives. It is not possible to take
advantage of the free access to scholarship that is offered on the Internet without the
ability to get online. As such, there is a solid link between the digital divide and the
knowledge gap.

With the ability to get online the ability to access scholarship for free via the
initiatives mentioned is a definite plus for developing nations that qualify for the
initiatives which have been specifically created for their advantage. Developed nations
can also take advantage of free access to scholarship via open access journals. Open
access benefits both developed and developing nations in that it provides access to free
academic literature to those interested. It is of particular value to those who are unable to
access scholarship due to expensive subscription fees or a lack of access to print journals.

Although open access to scholarship can not solve all of the problems associated
with a lack of access to academic literature and expensive subscription costs, it is one

idea and available option that can most definitely make a difference. With more access to technology and an increase in the kinds of academic journals that are to be offered in an open access manner, it can be said that more people will be able to access and take advantage of scholarship that otherwise could not have before. The power of ICT's coupled with the notion of open access offers hope for those who have deficient access to scholarship.

Chapter 3
Method

This is a study aimed at measuring the access of faculty and students to print and electronic access to scholarship at the post secondary level of education in Cameroon. It relies on a survey of faculty, students and librarians to establish the degree of access, as well as their current satisfaction with and hopes for that access. Out of all of the countries to choose from, Cameroon was selected for a variety of reasons.

Firstly, it is a developing nation, one that is considered by the United Nations to be very poor amongst the poorest of nations. It is ranked 142 out 175 countries according to the Human Development Index (HDI). According to the Human Development Report (Human Development Reports, 2003), an independent report that the United Nations Development Programme (UNDP) commissions, the HDI is "a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living."

Cameroon is a country suffering from extreme poverty, poor health standards and a deficient education system. For example, the GDP (US$), as expressed in the HDI report (2003) stands at $1,680 as compared to Canada which ranks 8th and has a GDP of $27,130. In addition to this, the average life expectancy for a Cameroonian at birth is 48 years of age compared to Canada's which is 79.2. Furthermore, Cameroon scores 0.64 on the education index which is "one of the three indices on which the human development index is built. It is based on the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio" (HDR, 2003). In comparison to the top three ranking countries, Cameroon scores 0.35 lower as Norway, Iceland and Sweden scored 0.99 for their respective adult literacy rates.

In addition to Cameroon's standing as one of the poorest and most needy countries in the world, this country was also chosen because its universities are in a situation which is about to change regarding connectivity to the Internet via ICT's and ISP's. (Wirsiy & Shafack, 2002). And this makes it a country which may soon find itself in the position to take advantage of open access to scholarship. Once the technology is provided, open access can be considered as a viable means to improve access to academic literature.

Also, and thankfully so, Henry Kang, a former graduate student from UBC who is from Cameroon, was able to provide essential contacts who aided immensely in the gathering of this research data. Kivin Charles Wirsiy and Rosemary Shafack, two librarians from Buea University, made it possible to collect and receive the data vital to this study. Without them it would not have been possible to access information as easily from a developing nation. This is also one reason why Cameroon was chosen. It should be noted that Wirsiy and Shafack conducted these surveys from 2001 – 2002 by personally visiting 7 universities. They administered the questionnaires personally and supervised the completion of them. For these reasons, there is a very high completion rate in regards to the forms at hand. They made this analysis possible. It should also be noted that only one set is missing; the questionnaires from the University of Ngoundere could not be collected due to a student uprising that occurred at the time that Wirsiy and Shafack returned to get them.

Of the 7 Cameroonian universities, 6 are included here in this study. The people involved in this research come from: The University of Buea, The University of Douala, The University of Dschang , The University of Yaounde I, The University of Yaounde II

and The Catholic University of Central Africa (UCAC). The proceeding background information about these institutions is summarised from a report entitled, *A Brief History of Higher Education in Cameroon* (Wirsiy & Shafack, 2002).

The University of Buea opened its doors in January 1993. This university and the 5 other state run universities were all created by government decree No. 93/034 on the 19th of January, 1993 (Wirsiy & Shafack, 2002). Buea offers studies at both undergraduate and graduate levels in subjects such as education, arts, science and social management science. In the academic year 2001/02, it had over 175 post graduate students and more than 215 faculty members.

The University of Douala began in January of 1993. Undergraduate and graduate courses are offered in its 6 faculties. Subjects at Douala include: letters and social sciences, juridical and political sciences, economics, and applied management and science. In 2001, this university had over 600 postgraduate students and a faculty of over 296.

The University of Dschang started in January of 1993 and offers courses in science, law and social science. It has five different faculties and two professional schools. This university had over 645 postgraduate students in 2001. Its faculty was over 294 during the same year.

The University of Yaounde I also began in January of 1993. Its three faculties are: Arts, Letters and Social Sciences, and Medicine and Biomedical Sciences. This university had over 3,900 postgraduate students in 2001 and more than 858 faculty making it the largest of the universities considered in this study.

Like all previously mentioned universities, the University of Yaounde II also began in January of 1993. This university has a Faculty of Juridical and Political Sciences, and a Faculty of Economics and Management. This university also has the Advanced School of Mass Communication (ASMAC), the International Relations Institute of Cameroon (IRIC) and the Institute for Demographic Research (IFORD). All campuses are located in Yaounde where over 965 postgraduate students and 264 faculty members worked and studied according to statistics from 2001.

The University of Ngoundere is not included in this study for reasons explained above. It is the 6th of 6 state run universities, and was created in January 1993. It offers studies at the undergraduate and graduate level in its 5 faculties. Its faculties include: the Faculty of Letters and Social Sciences, the Faculty of Juridical and Political Sciences, the Faculty of Economic Sciences and Management, the Faculty of Science and the Faculty of Sciences of Education. In 2001 the University of Ngoundere had over 200 faculty and 300 postgraduate students.

The last school considered in this study is the Catholic University of Central Africa (UCAC). Unlike the previously mentioned 6 universities, this one is private. The first six are state run universities. UCAC started in 1989 and offers studies in its five faculties: The Faculty of Social and Management Sciences (FSSG), Philosophy (FP), Theology (FT), Canon Law (FDC) and Higher Institute of Computer Sciences (ESI). In 2001/2002 it had over 1237 students and 164 permanent faculty members.

Of the universities involved in this study only the University of Yaounde I has its own Internet site. The University of Yaounde II, Dschang, Buea and Douala have information pages that are posted by the Agence Universitaire de la Francophonie (AUF)

but these sites are not from the actual universities and there is no contact information that exists in the form of email. The Catholic University of Central Africa does not have its own Website either but the International Federation of Catholic Universities has an information page posted for it and the email address of the rector is also available.

The questionnaires in this study were prepared by John Willinsky and Henry Kang. Two librarians from Buea University, Kivin Wirsiy and Rosemary Sutcliffe, were hired to distribute, collect and then send the results back to Vancouver, Canada. Thus, this research analyses already existing data that was initially prepared for the Public Knowledge Project. The results of this thesis will be combined with the analysis conducted by Kivin Wirsiy and Rosemary Sutcliffe to form a joint international publication of the larger project.

Of the 91 questionnaires answered, 48 were filled out by instructors, 11 by librarians and 32 by graduate students. The distribution of questionnaires at each university is as follows: The University of Dschang answered 15; The University of Yaounde I answered 17; The University of Yaounde II answered 18; The University of Douala answered 14; The University of Buea answered 21 and the UCAC answered 5. One questionnaire did not have the name of a university on it. The professors come from a vast area of academic backgrounds and teach many different subjects from the sciences and humanities. For example, professors of chemistry, physics, mathematics, English, law and computer science all answered questionnaires. Students likewise came from these academic disciplines and studied at the magisterial and doctoral levels.

The questionnaires asked about various important aspects of access to scholarly resources in Cameroon at the university level. Three types of questionnaires were used.

One was created for students, teachers and librarians respectively. The questionnaire was constructed in consultation with John Willinsky, Henry Kang, Kivin Charles Wirsiy and Rosemary Shafack to ensure that it was congruent with local language customs and that it addressed international issues of access to research and scholarship. Because Cameroon has French and English among its official languages, and those are the languages uses at the universities, the survey was translated into French and that translation further modified by Henry Kang to suit local language use. However, the survey was not piloted or otherwise tested for validity or reliability. It has been further refined for use in South Africa by Sal Muthayan, a doctoral student at UBC.

The survey was designed to ask different and specific questions to the three separate groups of people answering the survey and to also allow the same questions to be asked to all three groups or two of the three groups when necessary. This allowed for the discovery of specific information relating to each separate group and also information that relates to two or all three of the groups.

The questionnaires used for teachers and students were divided into the following three sections: Access to Scholarly Journals, Access to Internet Technology, and Resources and Policies. Copies of the blank questionnaires will appear in the appendix. The questionnaire for librarians was similarly divided into three sections with the following headings: Library Serial Holdings, Technology in the Library and, Resources and Policies. All three questionnaires ask about scholarly access in section A, access to technology in section B and resources and policies in section C. The questions were allocated into these three topics because of each one's specific relevance to the overall objectives and heart of this thesis.

Section A deals with scholarly access because it is necessary to find out what states of access are to both print and electronic forms of scholarship. Section B deals with questions about access to technology because this access directly effects access to scholarship via electronic means. Furthermore, any discussion which deals with open access to scholarship must deal with the issue of access to technology simply because if you do not have a computer with Internet accessibility it is not possible to use information of any form that exists via this medium. Finally, section C deals with questions about resources and policies in order to discover what is currently available in these universities regarding access to scholarship and also to establish what is planned or should be planned in the future to remedy potential hurdles and problems. Section C enables for the ability to gather information about what is in fact planned for the future regarding access to scholarship and also to gain information from the insights and opinions of students, librarians and teachers who are in the midst of using the academic literature that is currently available to them.

The questions asked in these three sections were aimed specifically at the kind of person answering the question such as a librarian or where possible general questions that more than one group could answer. For example, librarians were asked specific questions about their library holdings whereas students and faculty were not. But librarians, teachers and students were all asked questions about accessing the Internet because this question can be answered by all three parties involved in this study. In certain cases teachers were asked questions about research, publishing articles and how the Internet or access to the World Wide Web could improve their ability to help and teach their students. These are teacher-specific types of questions.

In asking students and teachers questions one is also provided with information from an older and younger generation of Cameroonian. In this light, it was hoped that responses from older and younger generations of academics would provide a more robust and richly textured explanation and picture of current states of access to scholarship at Cameroonian universities. Further to this, in asking librarians, teachers and students a variety of questions it was hoped that three different perspectives would also provide a more adequate explanation and results.

It is also noteworthy to mention that the three major groups of people were asked questions relating to the state of access to scholarly resources in three different sections of the questionnaires at hand in order to discover and analyse the vast and multifaceted array of issues and topics that relate to the current state of accessing knowledge in universities around the globe today. Thus as stated in the aforementioned paragraph it was necessary to ask specific questions to teachers that relate only to teachers and such is also the case with students and librarians. Another example of this would be questions asked only to students because they deal with doing homework – something only students do. However, in addition to this strategy it was also important to ask questions that possibly two or all three groups are effected by such as the current state of access to ICT's that provide the ability to go online and search for academic journals and knowledge.

In this manner a global perspective of the current state of access to scholarship in Cameroonian universities is possible in addition to a focused and specific perspective on issues that potentially only effect librarians or one of the other two groups concerned. For example, questions such as: Where do you currently access the Internet? or What is your

current satisfaction level with accessing online academic information? can be asked to all three groups because all three groups can answer these questions.

After the questionnaires were filled out an analysis of the results took place. Firstly, all questions were read and compared amongst the three groups to decide which questions stood alone and which questions covered more than one group. Tables were created to display the results of important factual questions that one or more groups answered. All the measures were moved to rankings out of 100 or as a percent. For example if there were four options, from poor to excellent, then each response level was considered worth 25 points up to excellent which was scored at a 100. This was done to ease averaging and give a common measure. Once the tables were created, the comments and explanations in each questionnaire were studied to locate telling commentaries and facts about the various attributes of access to scholarship in Cameroonian universities. Some of these included answers to questions about access to print journals, electronic journals, the Internet, technology and open access journals found online. The telling commentaries and facts were based on answers that can be divided into two types.

Firstly, questions were asked that required quantitative and factual types of responses such as: How often have you accessed the Internet in the past month; Where do you access the Internet; or Are there currently any print journals not available in your library that you would like to access on a regular basis? Whenever possible a table was created for questions like this. The second type of question required more qualitative responses where descriptions and opinions were requested. Responses like this were used as quotes. Thus, the responses in these questionnaires are both factual and opinionated.

In addition to these types of comments, questions which asked about how to improve access were also asked and analysed for this study. Once the tables were created and the commentaries were collected, the write up commenced. The quotes of the people involved in this study were used in combination with tables and an article created for this study about Cameroonian universities (Wirsiy & Shafack, 2002) to portray the current state of access to technology and scholarly information in addition to revealing what is needed to improve upon this state of affairs.

Finally, it should be said that the method of analysis mostly worked very well. Asking questions to three different but equally important groups of people involved in the focus of this study helped to portray a more complete picture. Asking individual types of questions to specific groups in addition to asking general questions to two or more groups was a successful strategy that allowed for detailed responses which revealed important results. In addition to this, asking both qualitative and quantitative questions was positive and insightful. The chance to read comments and opinions about the current state of access to scholarship in Cameroon proved to be more revealing than the majority of the questions that were answered and used to create tables.

In order to take advantage of the very informative comments made by the Cameroonians involved in this study, I devised a method for organizing all of the relevant quotes discovered. I looked through all of the questionnaires and categorized all of the comments by labeling what kind of person said it, what question it was and what topic it spoke about. The creation of this document proved to be invaluable in the writing up of the third chapter of this thesis because the quotes were organized ahead of time according to the three sections that the third chapter is separated into.

If I were to do this again, I would make the following changes. I would make three identical questionnaires where all the questions in each section were numbered the same and in the same section. This was not done in the first place and as such, it made a lot of extra work when it came time to analyse the results and create tables. In order to ask individual questions to each group, I would add an additional section to each questionnaire that contained specific questions for librarians, teachers and students respectively. In the directions for the questionnaire, the questionnaire takers would be asked to respond to the questions in section D that were aimed at them only. Thus, sections A-C would be identical and Section D would contain questions aimed at specific groups only. If you were a librarian then you would only answer the librarian questions in section D. In retrospect this would save a lot of time and make the analysis simpler because all three types of questionnaires would be identical in the first 3 sections yet at the same time still allow for the discovery of specific information from a certain group in section D.

In retrospect, some of the questions were irrelevant and could have been omitted but this was perhaps not something that could have been foreseen. It is far simpler to know what to do the second time around. In addition to these shortcomings, I believe that the most important improvement that could be made to these questionnaires is the addition of more questions that directly ask about access to scholarship and technology because it was these questions that were asked which provided the most information. Many other types of questions that were answered were not used in this study. This in addition to a clear set of directions at the beginning of the questionnaire would perhaps provide even more telling responses. Some questionnaires were left blank and perhaps

clearer directions would remedy this. Overall, the method used was successful and revealing. Using 3 sections, 3 groups of people and a combination of factual and opinion types of questions enabled for the discovery of the current state of access to scholarship in 6 of 7 of Cameroon's universities.

Chapter Four
Research Results

This chapter reports on the research findings drawn from the questionnaires distributed among the faculty, students and librarians in Cameroonian universities. It is divided into five sections: access to technology, access to scholarship, individual needs, a final section on needs and a conclusion. In the first section, the state of access Cameroonian universities had to technology in 2002 is assessed. The second section discusses their access to print and electronic sources of scholarship making clear that the academic populous of Cameroon faces limits in access to important academic sources of information such as print and electronic access to scholarship and how the people of this country deal with it in their everyday academic lives. The third sections discusses individual access. The fourth section treats the needs expressed by the participants, needs for access to technology, online access to computers and the availability of both print and electronic sources of scholarship. When necessary, statistics have been provided from a document entitled, "A Brief History of Higher Education in Cameroon," prepared by the two librarians from the University of Buea in Cameroon who assisted in gathering this research data: Kivin Charles Wirsiy and Rosemary Shafack.(2002).

4.2 Access to Technology: The Digital Divide

A lack of access to computers and the Internet sums up the state of affairs currently for the participants from the six Cameroonian universities who answered questionnaires for this research project. Out of the six universities that filled out questionnaires, all of the librarians point out that their libraries are in possession of somewhere between 0-10

computers each. And not all of these libraries are capable of going online. At best the universities have limited Internet access.

In "A Brief History of Higher Education in Cameroon," Wirsiy and Shafack describe how the University of Dschang has plans to connect itself to the Internet via satellite. The university has yet to achieve this capacity. And as such it has zero access to computers with online access. In 2000/01, Dschang had over 645 post graduate students and 294 faculty members.

As a result, the students and faculty have to rely on commercial services outside of the university to access the Internet. As Wirsiy and Shafack point out, "students and lecturers have Internet services in nearby Bafoussam and other towns especially Douala, Yaounde etc." (2002). Their report does not explain how accessible these services are in regard to cost and availability. Furthermore, this report fails to explain, in most cases, what access equals out to quantitatively. It is the high cost of Internet access and a lack of technology and information that prompted the University of Dschang's central librarian to point out that the most popular format for consulting research literature among students and faculty is print form. This librarian further points out that Internet access is very expensive and not accessible for many.

In looking at the responses from students, faculty members and librarians to questions such as: "Where do you have access to the World Wide Web?" and "What is your principle form of access to scholarship and why?" that a more robust and honest picture of the current Cameroonian state of affairs is adequately sketched. These questions were asked in the questionnaires provided to students, librarians and faculty members attending these Cameroonian institutions of higher learning.

Among the respondents to the survey, Kenneth Davies, a political economy graduate student from the University of Dschang explained that one reason why he only accesses the Internet every second week is due to "limited means and very few providers." He points out that the lack of Internet providers encourages a monopolistic spirit and this makes access fees more expensive. Thus, although Internet services exist in nearby Baffousam and Douala, the act of getting online has its hurdles and deficiencies. In addition to this, Davies explains that when he is able to get online he does not use it to access scholarship because he cannot afford it and the existence of these sites is rare and expensive Finally, he also believes that it is very important to increase the numbers of computers and printers in the library and access to the World Wide Web in relation to improving his work.

Timothy Rupert, who is also a political economy graduate student at the University of Dschang, sheds further light on the state of access to technology at this institution and part of the world. In one month he reported spending a total of 30 minutes on the Internet. He also points out that due to the limited number of computers and online connections that exist, there is a private monopoly on accessing the Internet and this leads to higher prices, making it financially difficult to spend time using this technology. During the month the survey was conducted, he did not access the Internet at the university, home or a public facility because, as he states, this is not possible. As such, he must use the services of a private Internet provider who is monopolizing access in his city and as such charging high rates that Rupert is unable to afford.

The University of Yaounde I offers Internet access in two locations: the computer centre and the multi-media centre (Wirsiy & Shafack, 2002). Public access also exists in

cyber-cafes and public libraries. Access in the library is not possible and that has its own impact on what student's access, as they do not have the advantage of a librarian's expertise or guidance in finding research resources online. The library is a critical location as it suggests and supports the idea that the Internet has become a site for the circulation of research and knowledge. Fortunately, there are plans to connect the library to the computer centre in the future. One of Yaounde I's librarians, Ms. Sparks, states of access to technology in the university library that no computers are connected to the Internet and there are no printers available for students or teachers to use. In addition to this the librarian points out that it is not possible to access research information via CD ROM, microfilm or online because this technology simply is not yet available there. There are no subscriptions to electronic serial indexes or databases and no free online indexing services either; this is directly related to a lack of technological access and ownership. At the same time, print sources are extremely scarce, with no prospect of improving given the rising costs of subscriptions.

Fergus Henry, a doctoral student studying anthropology and sociology at Yaounde I accesses the Internet via public facilities and uses this access to technology to do research and communicate. However; in the last year this student points out that Internet access fees have become more expensive. Ernest Woods, a doctoral student studying English at Yaounde I, further illustrates how expensive fees for accessing technology exist. In this student's opinion, the greatest challenge in getting online access to journals is the cost of Internet access in Africa. Like Henry, Woods accesses Internet technology in public facilities and also comments on the problem of unaffordable user

fees. These students can not use the Internet at their university. And when they do so elsewhere, they face financial hurdles because fees are too costly.

Finally, in Sparks' view, the principal challenges facing university librarians over the next five years in assisting professors and students with their work will be in her own words, "matching up with modern tools of research and communication [on] a global basis." In other words, getting the modern tools for research and communication is what will be the most difficult hurdle to overcome in order to aid students and teachers properly in their respective studies and research. Despite the hurdles faced and the distance that needs to be covered, Spark's voices her view with determination and vision, as she sees what needs to be done.

At the University of Buea, things are somewhat better. The library has ten computers (Wirsiy & Shafack, 2002). In reading this it is important to keep in mind that the University of Buea had over 175 postgraduate students in the 2001-2002 faculty year and also a faculty with over 215 members the year prior. On average this means that about 39 people are expected to share each computer. And this does not factor in undergraduate students either. Furthermore, when Kevin Wirsiy, the librarian at Buea, was asked how many computers are currently hooked up to the Internet via what specific connection type, he responded with a grand total of 3 that are hooked up to ADSL.

While an information technology centre that would provide access to the Internet throughout the campus via optical fiber cable has been commissioned, this has yet to be realized. Again, the plans are in the works for making the basic hardware connections to the Internet. As Wirsiy points out in response to the questions asked in a questionnaire that he filled out, access to online journals is going to depend, in the first instance, on the

ability to access digital technology. His comments reveal the close relationship between access to technology and the ability to access information. Wirsiy is not alone in this observation either.

Michael Farnsworth, a doctoral student from the University of Yaounde II, explains this relationship very clearly in his response to a question asking him what his principal concerns are regarding any efforts to increase online and open access to academic information. Farnsworth states in this regard, "In our Southern countries where the Internet is still considered a luxury, the main concern would be material in nature. It's a prerequisite to access those journals. The priority should be to allow schools and universities to get connected at a low cost."

Wirsiy also states that until the library and campus are hooked up to the Internet, it is this access to technology that is a principal concern regarding accessing scholarship because as was also pointed out by students studying in Dschang, accessing Internet services outside of the university -- be it through a private provider as Rupert explains or publicly as Wirsiy elucidates here -- is very expensive. There are also instructors from Cameroonian universities who concur with this. These professors point out that the greatest challenge to accessing online journals is expensive fees and the unavailability of services.

For example, an assistant professor from the university of Buea states that the greatest challenge to accessing online journals is that Internet services are not available on campus and that services that are available are too far away and expensive. A chemistry professor from Buea concurs that there are no available Internet services and

that public booths are very expensive. Finally, an English professor from the same university also concurs that there is a lack of access and finances.

On the other hand, even though the campus is not hooked up, the library's recent wiring to the Internet has allowed Buea University to have recent access, in Wirsiy's own words, "to over 1,500 online full-text journals through the World Health Organisation and African Journals Online." Even though there are but three computers that can access these journals at Buea University, each of those machines offers the resources of respectable library, especially in the area of medical research (through the WHO). Once a Cameroonian university has access to computers which are online, there exists access to a large amount of beneficial open access (free) scholarship through initiatives which have been created to aid developing nations with obtaining this needed academic information.

The University of Douala has Internet access in its postgraduate school and lecturers and students can access the Internet at the Postgraduate School Library. All other campuses are not connected and thus access is limited to this one location. This library is connected to the Internet via satellite and has, according to the librarian, Elizabeth Romero, four computers with Internet access and no available printers for students and faculty to use. Unfortunately, these four computers are to be shared with a population of students and faculty that reaches well over 500 people. According to statistics (2001) from the Ministry of Higher education, Douala has more than 600 postgraduate students and more than 294 faculty members. Thus, like Buea, although there is access to technology allowing for Internet access, it is to be shared among such a high number of users that it is indeed very limited. Douala also has four libraries.

The University of Yaounde II is connected to the Internet via optical fiber cable and satellite but the majority of functioning infrastructure has not been built yet. According to Chloe Lake, the university's librarian, the library itself does not have any access to the technology that has made it to the campus. There are no computers and no printers and without computers there is no access to the Internet. Lake points out that the current access to research is in the form of print only because "the library has not been computerized yet." Access to this technology is needed for the library and at that point access to scholarly information will increase with the assistance and guidance of the librarians.

The Catholic University of Central Africa (UCAC) has two campuses located in Yaounde and both have Internet access. However, as we learn from the assistant librarian Julie Withers, the library has access to less than 11 computers. Of this number, only 5 have computer printers that students have access to and there exists 1 computer with a single printer for faculty. In 2001-2002, this university had a total of 164 full time faculty members and 1237 students. Withers also points out that access to the Internet has only recently been implemented for the 2002-2003 academic year.

4.3 Individual Access

Now having reviewed the larger question of access for the six universities, I turn to the question of access for individual faculty and student, in this case of the 76 participants in the survey, made up of 45 faculty and 31 students, only 5% had access at home and only 28% had a connection at university. The majority of people accessed Internet technology

via public or other sources with 75 percent accessing public facilities and 16 percent accessing other types of facilities.

In some cases, people used more than one method for accessing this technology and this explains why the percentage totals in the proceeding table can equal more than one hundred (Table 4.1). A considerably larger percentage of people access this technology off campus and not at home via public facilities and other sources. As stated earlier this access tends to be expensive and difficult to attain.

Table 4.1. Sources of access to Internet technology by percentage.

	Students ($n = 31$)	Instructors ($n = 45$)	Combined ($N = 76$)
University	10%	40%	28%
Public	75	76	75
Home	3	7	5
Other	29	7	16

Information technology for students and professors is not widespread at any of these Cameroonian universities. It is only recently that Buea's library has been wired to the Internet and even in this case they only have 3 computers which are to be shared as was pointed out earlier, with an average of more than 130 people per computer. At Douala, 4 computers with Internet access are being shared by well over 500 people. The state of access to technology for students and faculty at Cameroonian universities is lacking and although, in some cases, there are plans to set up campus networks – this has yet to be achieved.

Students and instructors from Cameroonian universities regard access to the World Wide Web as most important issue and the provision of more computers and printers on campus took second place as a priority (Table 4.2). Instructors and students appeared to differ on the value of print journals, with the instructors not surprisingly more interested in print editions, ranking it as second in their priorities, while the students ranked computers in their top three priorities, with online journals second in rank. Faculty placed online journals relatively low on their list of priorities, reflecting their continuing support for print journals as the traditional source of authoritative knowledge.

Table 4.2. Rating level of importance for library priorities (out of 100).

	Students ($n = 31$)	Instructors ($n = 45$)	Combined ($N = 76$)
Subscribe to more print journals	83	92	87
Improve access to African journals	84	82	83
Improve access to online journals	88	78	82
Improve access to online serial indexes	83	81	82
Provide more computers and printers	86	89	88
Provide access to computers outside of library	87	86	86
Increase access to the World Wide Web	92	98	95

Given that increased access to the Internet was ranked highest among the priorities of the library among the three groups, it is worth considering their individual comments on the value of access. A number of professors from various universities commented on how access to the Internet could help them with their teaching and research. Improving upon this current need for more access to technology and academic information would allow these instructors to do the following things they mention. A life

sciences instructor from the University of Buea points out how teaching aids can be downloaded from the web and that this can "greatly facilitate teaching." This professor believes that access to the Internet would "help in making me know the current state of research in various areas of research. One will also be able to read up to date articles."

A chemistry professor from this same university remarks that accessing the Internet would help to "consult books for teaching [and] get information on new evolving ideas." In regards to research this professor comments that access would help the research process because one can "consult journals" and that it would also help to "write up papers for publication." An English professor from the University of Buea believes that access to the World Wide Web would help teaching "very much" and states "it will help me get current materials that will aid in more effective teaching." In regards to research, this professor states that access will "help in making available material that I can consult in carrying out research."

A science professor at this same university points out that access to the World Wide Web would facilitate teaching in that as he states, "whatever course I am teaching I can search for lecture notes from the Internet and also books that can assist me." Regarding what capacity this access has to ameliorate the research process this professor explains, "I search for articles relating to the topic of my research from the Web. I also look for journals where I can send my papers using the Web."

One professor from the University of Douala believes that Internet access can "enrich bibliographical references" and that this aids one in teaching. He also points out that the Internet aids in research because he can use it "to update my literature review, exchange ideas [and] share research questions." This same access can also help students

in their studies. As a professor from Yaounde I states in regards to World Wide Web access advantages, "[it helps] me to be more current to keep up in the field and acts like a forum to know about other ideas." While one student comments, "The web will help us a lot in our studies as the world is becoming like a global village. We could even take a course in economics from London while staying in Dschang." Another student explains that World Wide Web access will help more with school work "by giving us access to the most recent journals, articles, the proceedings of seminars and symposiums, the chronicles of events, and especially by allowing us to participate and exchange in international conferences."

What proved to be one of the most telling questions posed on access to knowledge was: Can you name journals not currently available in the library's collection that you would like to consult regularly? Although some answered generally with responses such as "all," "none are available," and even as one philosophy student from UCAC stated, "the large majority," these responses spoke to the awareness of being cut off from the circulation of knowledge. Still, what was more striking was the naming of 42 specific journal titles by students and 158 titles by faculty members. That is, students and faculty were able to name 200 journals which they have missed having access to for regular consultation in support of their work. When asked about how happy they were with their current level of access to journals, the average for satisfaction levels was 35 out of 100, with faculty somewhat less satisfied than students (Table 4.3). The key here is that access does matter, and in very specific ways, which the Cameroonians can name by titles, which they have learned about, which they are interested in learning and working from but which they are not able to read. There is little sense in having learned to live with this

lack of access or of making do, or of not having the interest or inclination to be a part of this larger circulation of knowledge.

Table 4.3. Satisfaction level with current access to scholarly journals (out of 100)

	Students ($n = 32$)	Faculty ($n = 46$)	Combined ($N = 78$)
Access to journals	40	32	35

Librarians and professors were also asked to express their view on the level of importance access to research has on various factors such as working with graduate students, participating in scholarly communities and other important occurrences that take place in the academic milieu such as ones ability to research and publish (Table 4.4).

Table 4. 4. Level of importance (out of 100) of access to research for academic concerns.

	Librarians ($n = 10$)	Instructors ($n = 45$)	Combined ($N = 55$)
Teaching	70	81	79
Working with graduate students	75	91	87
Conducting research	91	96	95
Writing up research	89	93	92
Publishing research	80	92	90
Participating in scholarly communities	47	84	78
Providing counsel to public bodies	47	68	64

Librarians and faculty both recognize that research is needed, above all, as a starting point for conducting research, but it is also important for writing up research, working with graduate students and publishing research. It is worth noting as well that access is seen as far more important for participating in scholarly communities for faculty than it is for librarians. Perhaps this is because it is more apparent to faculty that such a community is dependent on the sharing of research and a level of familiarity with current research.

If the current state of access to academic information is not satisfactory and it is this information that is of crucial importance to conduct research, write it up and publish it then it is obvious that it is difficult to do so for Cameroonian academics. It can be inferred from these tables that performing research, writing it up and getting it published are academic tasks that are being directly effected in a negative manner by a limited ability to acquire knowledge. The knowledge gap is directly responsible and at play here.

Access to electronic sources of information at these universities is uncommon. At universities such as Buea and Douala that have access to the Internet, the number of computers is miniscule and as was explained in the first section of this report these computers are to be shared with many people. It must be reiterated that without technology, access to scholarship via the Internet is impossible. However, once online and with enough computers to go around, there exists many initiatives that are ready to offer open access to journals as was reported for example about the University of Buea.

All of the universities have potential access to thousands of free journals through the World Health Organisation and INASP [check out website for details] have made this possible through open access initiatives to narrow the information gap. Thus to state that

this university has open access to online academic information is one thing but to describe in what capacity is quite another. The digital divide or lack of technological means is one hurdle that must be overcome if online access is to be achieved at these universities.

Even with this limit in access to online resources, when asked to comment on what would be some of the principal advantages of increasing the number of online journals that are free or open access, Rupert responded in a very positive way, "There are too many advantages to give a full enumeration here. Among others, I would say the lessening of the information gap between North and South, the opportunity of conquering markets…and the increasing field of knowledge."

Caroline Ship, a graduate student from the University of Douala, also identifies the increase in the viable knowledge amongst other advantages, "It would facilitate our academic endeavors, help us get more information in our field and gain increased knowledge." Likewise, Farnsworth also believes the relationship between open access and academic advantages when he states, "The main advantage [of open access] would be an increased access to information leading to school work more in line with recent research and developments.

The librarian Kivin Wirsiy remarks that the principal advantages of increasing the number of online journals that are open access "will make available more research literature to our students and faculty as there is a campus-wide Internet link which will enable them to have both access to subscribed and open access online journals." Thus, even though this access is currently limited to three computers at the University of Buea, their librarian points out benefits that will be attained when more computers are available.

Instructors point out some of the principal advantages of increasing the number of online journals that are open access too. If journal access was online and free, one professor points out that there would be, "vastly increased access to literature, improvements in teaching methods, reduced reliance on teacher's notes, [and] improved initiative and innovation on the part of the students." Furthermore, another professor from the University of Buea says that: "It will greatly encourage the exchange of academic ideas and knowledge. It will also stimulate research in the developing world since they will easily have access to current information." This professor points out the relationship between current information and the stimulation of research. Without access to academic research and other forms of scholarly information, research is not a possibility. Thus open access to scholarship with a means to get online via the appropriate ICT's enables professors and students from Cameroonian universities to do more research because it can potentially solve the problem of an unavailability of scholarship in print and electronic form.

This kind of free access to scholarship also allows academics from developing nations such as Cameroon to access academic literature which is current. Accessing up to date knowledge via open access journals can enable a wider perception of what is currently going on in research fields around the globe. As one professor of applied languages from the University of Dschang explains in regard to the principal advantages of online journals that are open access, this can: "provide greater awareness to both teachers and students about research carried out in other parts of the world."

As stated earlier, accessing journals online means being able to access the Internet or World Wide Web via the appropriate technological infrastructure. The relationship

between the two is an unavoidable necessity. Many of the Cameroonian instructors who partook in this study equate the ability to access the World Wide Web with an immediate increase in access to relevant academic information. Although Cameroonian universities current access to online scholarship is deficient, professors are nonetheless aware of the benefits it can have for teaching and research. They also realize how accessing the Internet equates to accessing academic knowledge in certain respects.

In the words of a health sciences professor from the University of Buea regarding how the World Wide Web can help more in relation to teaching, it can help with, "studying new clinical and diagnostic findings." And in relationship to accessing scholarship for research purposes, this professor says, "I will be able to do collaborative work with other researchers, have access to some of the high tech research laboratories when they are organizing workshops regarding their skills." Furthermore, a chemistry professor from the University of Douala comments that this ability will help "to keep abreast in new developments in the field of physical chemistry, especially if there is a better understanding of physical phenomena which was glossed over before."

An English instructor at the University of Douala explains how this access will aid in acquiring scholarly information for both teaching and research. In this professor's words, "It can help me in getting more resources in my area and in participating in discussion groups as well as getting courses in the area for my students…It can help me in literature reviews and getting more access to publishing outlets."

A professor of common law at the University of Dschang further points to the benefits that Internet access has in relation to acquiring and accessing academic information for instruction and research purposes and the hurdle it also represents. This

professor states, "It will definitely help me in giving me material. But the trouble is that we do not yet have adequate access to it…It [can] help in developing my private research, especially in publishing articles."

An analysis of some of the data in this study exemplifies the level of access to print journals (Table 4.5). This was achieved by asking both students and professors to comment on the number of times they accessed scholarship in print form over a one month period of time. Based on the previous mention of the fact that most universities are unable to access electronic journals on campus and the ones that are capable of doing so must share these computers with very high numbers of people per computer and adding the fact that it has already been established that accessing the Internet off of university premises tends to be very expensive and difficult, it is no wonder that accessing scholarship in print form is the primary manner, if not at times, the only way that these universities get academic information.

Table 4.5. Levels of access (by percentage) to print journals over previous month.

	Students (*n* = 29)	Instructors (*n* = 39)	Combined (*N* = 68)
Daily Access	7%	8%	7%
Thrice per week	10	23	18
Once per week	28	20	24
Once per two weeks	55	49	51
Total	100	100	100

About 50 percent of faculty and students access journals in print form about once every two weeks, 24 percent access once per week, 18 percent access three times a week and

finally 7 percent access on a daily basis. In comparing this table to the table 4.6, it appears that access is divided between print and electronic at this point, with figures suggesting substantial use of clearly limited resources in both cases.

Table 4.6. Level of access (by percentage) to electronic journals over previous month.

	Students ($n = 25$)	Instructors ($n = 33$)	Combined ($N = 58$)
Daily access	0%	6%	3%
Thrice per week	28	12	19
Once per week	12	36	26
Once per two weeks	60	46	52
Total	100	100	100

There are many advantages to accessing the World Wide Web via the appropriate ICT's in regards to accessing scholarship for Cameroonian teachers and students. Many of these principal advantages are pointed about by Kivin Wirsiy, a librarian from the University of Buea:

> The most important advantages of www access for university libraries in Cameroon are access to vast information resources (open access), access to online research materials, especially journals, thus maximizing space and easy document delivery and thus an increase in interlibrary loan cooperation and faster search possibilities.

With this kind of access certain challenges exist for Cameroonians in the academic milieu. Acquiring the technology, learning how to use it and high costs are three difficulties that Wirsiy explained in terms of hurdles that librarians must face and overcome in the next 5 years if they are to help students and faculty better. These comments illuminate some of the major factors that are involved in making access to

scholarship via ICT's a possibility. As he states, "The main challenge will be to harness the digital technologies and make them available to users. The other challenge is the effective and optimal use of these digital technologies that necessitate [the] training and mastering of them. Lastly, the fact that these digital technologies are very expensive for us in Africa makes it a big challenge to acquire them."

4.4 Needs

It has been established that access to both technology and scholarship are lacking in Cameroon. Once online, numerous advantages present themselves in regards to attaining scholarship. As such, any discussion of how access to the World Wide Web or Internet can improve access to scholarship automatically implies a need for the infrastructure to allow for this. Cameroonian universities are in need of technology and scholarship. They need both print and electronic forms of academic information. Open access provides one way of accessing scholarship if the technology exists to use it.

The majority of students, teachers and librarians agree that open access is important to increase access to African and overseas journals. The rating of the importance of open access journals was scored relatively lower than the priorities set for online access more generally (Table 4.7). And while the concept of "open access" may not be well understood, and there may be concerns about the quality of journals that are open access, there ratings of its potential value are still revealing. The students, for example, rank access to African journals ahead of the other items in the question, not only suggesting an interest in their own continent but reflecting a pressing problem with scholarly publishing in Africa (discussed in chapter two of this thesis).

The hope of seeing African journals develop and develop a global presence is one of the promises of open access, and it is encouraging to see this interest among the graduate students. In contrast, both instructors and librarians put greater weight on overseas journals which represents the area of known loss or absence for them, knowing better than the students the established reputations and importance placed on these publications. Such access is part of the open access promise, and has to a degree been realized by the HINARI and INASP open access projects that provide access to thousands of online titles to Cameroon and other developing nations. Still, none of the groups endorsed with much support the creation of new African journals, which can perhaps be taken to indicate a need for catch up through access to what is already published, as only then can a research capacity be developed that might lead to the creation of new journals. Finally, it is worth noting how the indexing of African journals was ranked higher by students and librarians, raising questions about whether faculty had much faith in journals produced on the continent.

Table 4.7. Level of importance (out of 100) posed by open access publishing for scholarly purposes.

	Students ($n = 32$)	Instructors ($n = 41$)	Librarians ($n = 8$)	Combined ($N = 81$)
Increase access to African journals	74	64	68	68
Increase access to overseas journals	53	72	76	65
Increase the international indexing of African journals	63	39	63	50
Improve opportunities of publishing in overseas journals	56	62	60	61
Increase opportunities for publishing new African journals	57	57	55	57

In addition to this need for access, another important necessity is educating librarians, students and teachers in the proper manner so that they know how to use information technologies to the best of all of their advantages. Librarians will especially need to know how to use ICT's in order use both traditional print forms of academic information and the newer ones provided by information and communication technology.

It will be librarians who will need to inform and help students use these technological methods of academic information storage, retrieval and communication. As the librarian Wirsiy states in this regard in response to the question: What are the principle challenges facing university librarians over the next 5 years in assisting faculty and students in their work:

> The major challenge will be to get faculty/instructors and students to use digital technologies effectively to have access to information and knowledge. There will be a need to orient them on the best way of using electronic resources as well as print based resources. This means a more intensive user education programme and continuous training of users. There will also be the need for librarians in Africa to get adjusted to both traditional library management and the use of information and communication technologies.

4.5 Conclusion

Access to technology and scholarship in Cameroon is in a deficient state. The universities students and professors are not satisfied with the poor state of access that they have to academic literature. The most common form of academic scholarship that is being accessed is in print form due to a lack of technological and financial means. But even in this mode of acquiring academic knowledge, professors and students from six Cameroonian universities mentioned 200 individual names of print journals that are unavailable that they need to access on a regular basis.

The lack of technology means that there is a lack of online access to the Internet which prevents them from taking full advantage of the thousands of titles made available through the World Health Organisation and INASP. While having to share a few computers among an entire university is difficult, the slow increase in the number of machines and connections is the only promising way forward for them.

The University of Buea has 3 computers with access and The University of Douala has access to 4 computers to get online. But again, like the University of Buea, and even worse so, they must share their 4 computers with over a combined total of 500 professors and students. The logistics of sharing so few computers with such a high number of people must be close to impossible. Research and learning seem almost unfeasible under such conditions.

Still, teachers, students and librarians alike are conscious of the benefits of online access to the World Wide Web. They realize that this type of access can improve the availability of academic information and knowledge. Furthermore, professors are aware of the implications accessing the Internet has in regards to helping one with teaching and research activities.

Costly access prices to public and private Internet facilities, the total lack of ability to go online in some campus libraries such as the University of Dschang, and the existence of very few computers with online access at the University of Buea and the University of Douala balk access to scholarship and make it difficult to research, teach and study. Without access to academic information, it is very difficult to do what must be done in a university environment. Fortunately, plans are underway for greater connectivity, and the results of this study provide some basis for optimism about the

results of investment in technology, as the faculty, students and librarians are eagerly awaiting greater opportunities to make use of this technology and this new level of access to information to further their research and their teaching.

Cameroonian students and teachers need more print journals, more technology in the form of computers, printers and access to online resources. They need access to online and open access journals. They need to be able to take advantages of initiatives like those provided by the World Health Organisation and African Journals Online – something that can't be done without the technology that provides access to it. Although changes are being made and access to technology and scholarship is gradually improving, these initiatives are only able to help those who can sit down in front of a computer, whether at the university in too few cases, or at their own personal expenses in cafés or other public access venues. There was no shortage of interest expressed in greater access to research by these students, faculty and librarians, and it will take initiatives at many levels, from the level of hardware, software, and connectivity, with support from many agencies. Open access to research has begun to happen, through the efforts of the WHO, INASP and others. What we have here is a reality with potential and possibility and not one devoid of optimism.

Chapter Five
Conclusion

The initial review of the research literature established that efforts to increase access to academic and research information in developing countries using online forms of electronic communication like the Internet is an issue full of much promise and a variety of challenges. The state of access to research literature in developing countries has been described by the useful term *the knowledge gap*, meaning that those working in universities, as well as industry and government, suffer a lack of access to existing sources of scientific and other academic knowledge, when compared to wealthy nations. As such, wealthy nations have better access to academic research and there work is far more visible.

In addition, one major reason for this poor state of access is referred to in the literature as *the digital divide*, which refers to the very limited availability of ICT's which have become major components in access to knowledge. This means that a developing nation like Cameroon, which has very limited access to the Internet, can only take very limited advantage of open access journals and other initiatives which provide access to academic literature to developing countries such as HINARI and INASP. Still, the review of the literature did reveal major initiatives that presently exist which can help to remedy a lack of access to scholarship in developing nations once access to technology is in place such as the two just mentioned and many more. These initiatives exist, in part, to overcome the hurdles to accessing knowledge.

In light of these findings, this study sought to establish what the access to research literature is like in six Cameroonian universities based on a survey of 91 faculty

members, students, and librarians. Furthermore, the current state of access to print and online journals and the priorities and interests of these Cameroonians discovered in this study establishes what the introduction of the Internet can mean to scholarly communication in such situations. This suggests that the importance of increasing both the access to technology and research literature is both appreciated and supported by these people. What was found as a result of the survey is a basis for concern and optimism. Although faculty and student access to the Internet was limited and often expensive for them personally, the Cameroonians participating in this study were committed to the use and possibilities of this method of information dissemination to increase their access to scholarly resources and they look forward to overcoming their currently unsatisfactory state of access to the greater opportunities that are made available via online journals both from overseas and, more so among students, from Africa, for their research and teaching.

The results of this study complement what we already know from a review of the literature by providing a specific and in depth example of a country from the developing world that finds itself adversely effected by a lack of technology and scholarship. Furthermore, the research reveals that Cameroon's students and professors would also benefit from access to technology that would allow them to take advantage of open access initiatives to scholarship such as those offered by INASP, HINARI and the journals that are truly offered for free regardless of a countries development status.

This study confirms that Cameroon is a country, much like many of those represented in the literature, which suffers from both the digital divide and the knowledge gap. It confirms that Cameroonian universities might make a reasonable the claim on

funding agencies such as the World Bank and the United Nations Development Programme that they would benefit from the provision of technology and access to open scholarship online. At no point was this made clearer than when the students and faculty named at least 200 print journals by title which would add greatly to their work. We know that these universities have plans to access ICT's and as such these universities are perfect candidates to receive the benefits of open access to scholarship. This lends support to the idea that not only do funding agencies need to support the development of ICT's, but that faculty members around the world, in their capacity as editors and scholarly association members, need to explore ways of supporting open access to research, if only for developing countries such as Cameroon.

The situation of Cameroonian professors, students and librarians has been made clear not only with regard to their state of access to technology and academic knowledge along the lines of the following four major points.

Firstly this study presents an example of how a developing nation's post secondary students and professors access the Internet and use it for scholarly purposes, often at personal expense, when access to the Internet is not always available in the university's libraries. There can be, perhaps, no greater indication of a readiness to utilize and an interest in utilizing these new technologies within the scope of their professional work, and their potential contribution to research.

Secondly, the results of this study represent the particular aspirations and perceptions about open access and the use of ICT's for academic purposes by a group of people involved in the academic world who come from a developing nation. Again it affirms that there is awareness, readiness and interest, which might well be taken as

adding to the urgency of the need to address by the academic community worldwide this issue of a right of access to knowledge.

Thirdly, our knowledge of this issue has also been expanded by this study because it presents the voices and opinions of the Cameroonian people in academia on issues of the Internet and open access. It is this specific exemplification of people's thoughts, hopes and predicaments that is not readily available in the literature.

A fourth contribution that this research provides to what has already been reported in the literature is an account of the current state of access to print and electronic scholarship that the people of one developing nation's universities finds itself in. This research has provided this information for 6 of the 7 universities in Cameroon. Hopefully other researchers and open access advocates can benefit from the description provided here. Thus the larger question of access to Cameroonian universities has been provided for those in need of such information and also as a specific example of the state of access a developing nation finds itself in.

5.2 Information for Funding Agencies, Local Governments, and Participants

Funding agencies wishing to establish the state of need that Cameroon finds itself in can use the results from this research as an indication of the state of access to both technology and print and electronic scholarship. The local and government of Cameroon can take advantage of the results of this research for purposes of assessing their current state of access to technology and scholarship at the post secondary level of education. With the information in this study they can find out how individuals are using the Internet for scholarly purposes and how they wish to do so. Furthermore, the results of this study can

be used by the Cameroonian government to make the claim that its universities are lacking both technology and scholarship to any institution or organization that is offering aid in the form of ICT's. Furthermore, it can show how its professors and students are aware of the advantages that access to the Internet provides for scholarly pursuits.

The participants of this study can take advantage of this information as it can heighten their perceptions of their deficient situation and to realize that it is not only their own university that finds itself in this predicament, but it is the situation with the other universities, too. It can also teach them about the advantages open access can provide to people in their situation and hopefully as such it also advocates this way of using scholarly information as one that is hopeful, filled with potential and one solution to a serious lack of access to the scholarly literature that is necessary not only for educational purposes but for development as well.

5.3 Advantages for Academics

Generally speaking, this study can be advantageous to academics everywhere. All academics participate, in a sense, in the distribution and access to research. The responsibilities associated with this participation have only increased with new technologies that may be able to support alternative models of distribution, such as open access.

Given that, this document can serve as an educational text for students and professors who are new to the issues dealt with here because the literature review and the results found from this study exemplify, describe and discuss the major issues of concern regarding open access in developing nations in both a general and specific manner. The

literature review provides the newcomer to this subject with a basis for understanding the most important factors involved and the results from this study provide a very specific example of how this issues is played out in reality. This research can be used, then, by anyone interested in understanding more about how Cameroonians could benefit from a greater access to technology for academic research and studies. It can help them to appreciate how the Internet can be used in conjunction with open access to scholarship as a means to improving upon their present situation. This study also points out how the universities all have plans to gain access to the Internet in the future, which lends further support to the academic advantages that can be achieved through free availability of academic literature online.

5.4 Further Research Needs

Further studies of the access situation among universities in developing countries could be conducted for the purpose of comparisons, contrasts and individual results which would help to paint a bigger and clearer picture of what is going on, what is needed and what can be done to aid African universities and the universities of other developing nations. With more studies like this one, the academic world and those involved in advocating the benefits of open access will have a clearer picture of just how bad or good the situation of access and availability of scholarship is.

It is also necessary to conduct more studies like this one over time, in order to gage the amount of progress and change that is taking place in developing countries. For example it would be a good idea to interview Cameroonians again in three to five years to discover if the situation has been at all remedied. Thus initial and ongoing studies are

necessary not only to find out what is going on, but also how and in what capacity an increase in access to technology and open access to academic information is taking place. With this information, it will then be possible to make claims about exactly what the ongoing investment in technology can achieve for developing countries.

Once universities gain access to technologies that enable them to go online to access academic journals and research via open access, it will be important to find out how this changes the academic landscape at any given university. Thus for example, the University of Buea has access via three computers, and it would be interesting to find out just how the existence of these computers effects access to scholarship and if this actually makes studying, research and teaching better in the long run. Once universities gain the ability to take advantage of free scholarship we will need to know how this is taking place and to what degree it makes going to university a better and more educational experience. Without this information we can not say with specific examples how this access works.

The studies mentioned will help researchers and advocates of open access to find out how this type of knowledge dissemination and access unfolds. It will paint a detailed picture for those who wish to convince governments and funding agencies that open access is something that achieves positive results and a medium for communication that can potentially democratize accessing scholarship. The more specific examples that are gained from researching individual countries such as this one about Cameroon, the bigger and clearer the picture will be. It will be easier to make claims about the advantages of open access and it will also be easier to figure out how to overcome the hurdles that stand

in its way because data will exist that defines and exemplifies how open access has been achieved and used in particular cases.

Interviews in addition to surveys for narrative analysis and qualitative analysis would be advantageous so that the academic world and all those involved in this issue can hear the detailed stories and explanations that people have to tell about their lives in regard to this topic. This can be used to explain and exemplify what is going on in a form that might appeal to a wider range of people than survey results. Although the results from these narratives would perhaps be largely qualitative, I believe these types of accounts would serve the public well as a way of bringing to life the sometimes one dimensional appearance that data from tables and quotes taken specific questions. An entire story about how a group of students accesses scholarship via print and electronic form over the period of one year and written in the form of journal entries would no doubt reveal a great deal of information about how some people study when they do not have access to the Internet or enough scholarly information or if this access is limited and costly.

It will also be important to find out how students who get access are learning how to use it, how having this technology and access to scholarship is being used, how this has changed the academic landscape for research, publishing, studying and teaching and how this has changed libraries in the developing countries who gain this ability to get free scholarship and research information. This information will improve our understanding of how open access unfolds once it is in effect. Furthermore, it will reveal what open access journals are freely available, what kind of scholarship is being accessed the most via this medium and what kind of academic information is still lacking. There are many

open access journals that exist about science and medicine, but is there enough out there in the area of the social sciences and the humanities?

Finally, I think it is important to do further research into what open access journals are available for anyone capable of getting online and then to take this information and provide it to students and professors at a university like Buea, that has recently gained access to the Internet so that a study may be conducted over a period of time to see if the professors and students have been able to use this information to make their academic lives more enriched. In this manner, more specific information regarding the advantages of having open access can be acquired because these people can be asked to compare their academic lives post open access to pre open access.

In conclusion, I believe more follow up studies need to be done in developing countries in order to keep track of how their access to technology and scholarship unfolds and what this does to benefit some of the poorest countries in the world. In addition to this, I believe more studies about other African nations should be done and also likewise followed up on for the same reasons as Cameroon but also so that a more detailed and richer picture can be provided of how open access to scholarship via ICT's is one positive and hopeful way in which the citizens of this world can help to improve countries that find themselves lacking in knowledge and technology. With this research information available, it will be easier to make the claim that open access is a powerful tool that can democratize access to information because concrete examples of its success will exist and countries can be compared to discover commonalities and differences.

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Appendix I
Definitions of Open Access

What is Open Access?

The term "open access" has been defined in many ways. Amongst the many definitions,

the following "working definition" of an open access publication as defined by the

Bethesda Statement on Open Access sums up the most relevant aspects of what it means.

The Bethesda definition is important in that it has been created by many key open access

advocates and concerned groups and people such as Arnold Lutzker of the Open Society

Institute, Dr. Harold Varmus who is the Chair of the Public Library of Science and

Director of the National Health Institute, Professor Peter Suber of Earlham College who

is Open Access Project Director of Public Knowledge and Senior Researcher at SPARC

(Scholarly Publishing and Academic Resources Coalition) and many others. This is a

working definition and it does not address the many positive applications of open access.

In other words it does not really explain what it is capable of achieving but it does

provide an initial understanding of what it is even if one does not agree with each and

every point being made about it here. It states:

> An Open Access Publication [1] is one that meets the following two conditions:
>
> 1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, t transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship[2], as well as the right to make small numbers of printed copies for their personal use.
>
> 2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access,

unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository).

Notes:

1. Open access is a property of individual works, not necessarily journals or publishers.
2. Community standards, rather than copyright law, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now. (Bethesda, 2003)

The above definition speaks directly about open access publications and what it is that defines them. It however does not explain what this means as far as accessing documents of this ilk. Other definitions of open access shed more light on what this term means to the actual student, professor or researcher who is to take advantage of it. In this light, another useful definition is provided by the Budapest Open Access Initiative (BOAI). BOAI defines open access in a different manner than Bethesda's. There definition is as follows and it defines open access from the perspective of the user of this electronic medium for communicating scholarly literature:

By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited. (BOAI, 2003)

With these two definitions in mind one begins to see the multifaceted shape of open access take form and also how it can be beneficially used. One final definition provided buy Lund University's Directory of Open Access Journals (DOAJ) from Sweden is useful in that it takes these two previous definitions and exemplifies how in fact open access can work through its mandate. DOAJ's mandate is to:

increase the visibility and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and impact. The Directory aims to be comprehensive and cover all open access scientific and scholarly journals that use a quality control system to guarantee the content. All subject areas and languages will be covered. (DOAJ, 2003)

With this in mind as their aim, DOAJ defines open access journals as, "journals that use a funding model that does not charge readers or their institutions for access. From the BOAI definition [1] of "open access" we take the right of "users to read, download, copy, distribute, print, search, or link to the full texts of these articles" as mandatory for a journal to be included in the directory. (DOAJ, 2003)

Open access to scholarship means free academic information for all of those capable of receiving it. This idea exists today and is being implemented by a variety of different organizations, publishers and institutions. Open access to scholarship benefits both rich and poor nations because it is a cost effective way of potentially making available the enormous amounts of academic scholarship that exist to anyone able to get online.

Appendix II
Sample Questionnaires

Questionnaire for Librarians
Access to Scholarly Resources in Cameroon

This research is conducted in collaboration with the Public Knowledge Project at the University of British Columbia in Canada. The Public Knowledge Project is dedicated to expanding access to scholarly resources by helping to make this knowledge freely available on the web. Critical to increasing this access is convincing scholars and researchers of the importance of publishing in journals that make their contents freely available on the web. One way of convincing them is by demonstrating to them how vital such access is to universities in developing countries. In order to do that, we need an accurate picture of the current access to scholarly resources at universities in Cameroon.

A. Library's Serial Holdings

1. How many journals does the library currently subscribe to in total?

_____

How does this compare to the number five years ago?   _____

How does this compare to the number ten years ago?

_____

Can you give examples of particular areas or fields that have seen a decline in number?

_____

_____

Can you give examples of particular areas or fields that have seen an increase in number?

_____

_____

In your opinion, what reasons can account for these changes?

_____

_____

_____

_____

_____

2. With today's serial collection, can you provide a rough breakdown of the number or percentage of journals by discipline?

Social Sciences _____   Education   _____

    Life Sciences _____   Law   _____

Pure Sciences   _____   Technology _____

    Humanities   _____   Other   _____

---

3. How do you rate the importance to your collection of journals published in Africa compared to those published elsewhere?

More   **Equally**

Less

|_____|_____|_____|

Give reasons for your answer:

_____

_____

_____

_____

_____

_____

_____

4. For your faculty, what effect do you think access to research literature has on:

	Little Effect _ _ _ _ _ Great Effect					Unsure
	1	**2**	**3**	**4**	**5**	
Teaching	☐	☐	☐	☐	☐	☐
Working with graduate students	☐	☐	☐	☐	☐	☐
Finding research ideas and models	☐	☐	☐	☐	☐	☐
Conducting research	☐	☐	☐	☐	☐	☐
Writing up research	☐	☐	☐	☐	☐	☐
Publishing research	☐	☐	☐	☐	☐	☐
Participating in scholarly communities	☐	☐	☐	☐	☐	☐
Providing counsel to public bodies	☐	☐	☐	☐	☐	☐

B. Technology in the Library

1. How many electronic serial indexes and databases does the library currently subscribe to?

_____

What free online indexing services are of value to your students and faculty?

_____

_____

_____

_____

_____

2. What is currently the most popular format for consulting research literature among your students and faculty?

Print CD-ROM Microfilm Online
  ☐   ☐   ☐   ☐

Why?

_____

_____

_____

_____

_____

What do you think it will be in five years?

Print CD-ROM Microfilm Online

☐ ☐ ☐ ☐

Why?

_____

_____

_____

3. How many computers are there in your university library with World Wide Web connections?

☐ 0 – 10   ☐ 31 – 40

☐ 11 – 20   ☐ 41 – 50

☐ 21 – 30   ☐ more than 50

How many of these are connected to the World Wide Web by...

Modem ADSL Cable Satellite T1

_____ _____ _____ _____ _____

How many of these are connected to printers that faculty/instructors can use?

_____

How many of these are connected to printers that students can use?

_____

_____

4. What would be the principal advantages to increasing the number of online journals that are "open access" (available free of charge)?

_____

_____

_____

_____

_____

_____

5. What would be your principal concerns with efforts to increasing the number of online journals that are "open access"?

_____

_____

_____

C. Resources and Policies

1. What policies or initiatives, if any, are underway that will expand the library's research resources?

_____

_____

_____

2. What would you identify as the most important advantages of World Wide Web access for university libraries in Cameroon?

_____

_____

_____

3. What are the principal challenges facing university librarians over the next five years in assisting faculty/instructors and students in their work?

_____

_____

_____

4. What are the challenges that you, as a librarian face, in increasing access to knowledge through digital technologies?

_____

_____

_____

_____

_____

5. If "open access" publishing systems were used in the coming years to do the following five (5) things how would you rank them in importance (1=highest, 5=lowest, or leave items blank if not important)

- ☐ Increase access to African journals
- ☐ Increase access to overseas journals
- ☐ Increase the international indexing of African journals
- ☐ Improve the chances of publishing in overseas journals
- ☐ Increase opportunities for publishing new African journals

Questionnaire for Faculty/Instructors?
Access to Scholarly Resources in Cameroon

This research is conducted in collaboration with the Public Knowledge Project at the University of British Columbia in Canada. The Public Knowledge Project is dedicated to expanding access to scholarly resources by helping to make this knowledge freely available on the web. Critical to increasing this access is convincing scholars and researchers of the importance of publishing in journals that make their contents freely available on the web. One way of convincing them is by demonstrating to them how vital such access is to universities in developing countries. In order to do that, we need an accurate picture of the current access to scholarly resources at universities in Cameroon.

A. Access to Scholarly Journals

1. What is your principal area of study?

_____

How would you rate your current access to scholarly journals in this area of study?

Poor Adequate Good Very Good

☐   ☐ ·   ☐   ☐

What percentage of this access to research is through the university libraries?

_____

What percentage of this access is through private subscription?

_____

Can you name journals, not currently available in the library's collection, that you would like to consult regularly?

_____

_____

_____

_____

2. What serial indexes do you consult to find journal articles (indicate if print/online)?

_____

_____

_____

_____

_____

_____

3. How do you rate the importance to your academic work of journals published in Africa compared to those published elsewhere?

| **More** | **Equally** | |
| | **Less** | |

|_____|_____|_____|

Give reasons for your answer:

_____

_____

_____

_____

_____

_____

4. What effect do you think the quality of access to research literature has on…

| | **Little Effect _ _ _ _ Great Effect** | | | | | |
	1	**2**	**3**	**4**	**5**	**Unsure**
Teaching	☐	☐	☐	☐	☐	☐
Working with graduate students	☐	☐	☐	☐	☐	☐
Conducting research	☐	☐	☐	☐	☐	☐
Writing up research	☐	☐	☐	☐	☐	☐
Publishing research	☐	☐	☐	☐	☐	☐
Participating in scholarly communities	☐	☐	☐	☐	☐	☐
Providing counsel to public bodies	☐	☐	☐	☐	☐	☐

_____

5. How often did you turn to print (paper) versions of scholarly journals in the last month?

Daily   Thrice a week   Once a week   Once in 2 weeks

☐   ☐   ☐   ☐

What proportion of this was for teaching purposes: _____%

What proportion of this was for research purposes: _____%

---

6. How often did you turn to online (electronic) versions of journals in the last month?

Daily   Thrice a week   Once a week   Once in 2 weeks

☐   ☐   ☐   ☐

What proportion of this was for teaching purposes: _____%

What proportion of this was for research purposes: _____%

7. What poses the greatest challenge in getting online access to journals you would like to consult?

_____

_____

_____

_____

_____

B. Access to Internet Technology

1. Where do you have access to the World Wide Web?

University   Public   Home   Other

☐   ☐   ☐   ☐

How much, if anything, does this access cost you?

University Public Home Other

_____ _____ ___ ____

2. What are the main purposes for which you use the World Wide Web?

_____

_____

_____

Approximately how many hours did you use the World Wide Web in the last month?

_____

How has your use changed over the last year?

_____

_____

3. What **online** scholarly resources have you consulted in the last month?

_____

_____

_____

4. In what ways would you imagine taking advantage of online journals in your field that are "open access" (available free of charge)?

	Very Unlikely _ _ _ _ _ _ _ _ Very Likely					
	1	2	3	4	5	Unsure
Use as a teaching material	☐	☐	☐	☐	☐	☐
In work with graduate students	☐	☐	☐	☐	☐	☐
To keep up in the field	☐	☐	☐	☐	☐	☐
To find models and idea for research	☐	☐	☐	☐	☐	☐
To enrich your scholarly writing	☐	☐	☐	☐	☐	☐
As a source or outlet for publishing work	☐	☐	☐	☐	☐	☐
To increase participation in scholarly communities	☐	☐	☐	☐	☐	☐
To provide counsel to public bodies	☐	☐	☐	☐	☐	☐

5. Can you give examples of how the World Wide Web could help you more…

In your teaching?

_____

_____

_____

_____

In your research?

_____

_____

_____

C. Resources and Policies

1. How would you rank the following priorities in the university library to your work?

	Unimportant _ _ _ _ _ _ Very Important					
	1	2	3	4	5	Unsure
Subscribe to more print journals	☐	☐	☐	☐	☐	☐
Improve access to African journals	☐	☐	☐	☐	☐	☐
Improve access to online journals	☐	☐	☐	☐	☐	☐
Improve access to online serial indexes	☐	☐	☐	☐	☐	☐
Provide more computers and printers	☐	☐	☐	☐	☐	☐
Provide access to computers outside of library	☐	☐	☐	☐	☐	☐
Increase access to the World Wide Web	☐	☐	☐	☐	☐	☐

2. What would be the principal advantages of increasing the number of online journals that are "open access" (available globally free of charge)?

_____

_____

_____

_____

_____

_____

3. What would be your principal concerns with efforts to increase the number of online journals that are "open access"?

_____

_____

_____

_____

_____

4. If "open access" publishing systems were used in the coming years to do the following five (5) things how would you rank them in importance (1=highest, 5=lowest, use numbers more than once to reflect equal importance or leave items blank if not important)

☐ Increase access to African journals

☐ Increase access to overseas journals

☐ Increase the international indexing of African journals

☐ Improve the chances of publishing in overseas journals

☐ Increase opportunities for publishing new African journals

Questionnaire for Graduate Students
Access to Scholarly Resources in Cameroon

This research is conducted in collaboration with the Public Knowledge Project at the University of British Columbia in Canada. The Public Knowledge Project is dedicated to expanding access to scholarly resources by helping to make this knowledge freely available on the web. Critical to increasing this access is convincing scholars and researchers of the importance of publishing in journals that make their contents freely available on the web. One way of convincing them is by demonstrating to them how vital such access is to universities in developing countries. In order to do that, we need an accurate picture of the current access to scholarly resources at universities in Cameroon.

A. Access to Scholarly Journals

1. What is your principal area of study?

_____

How would you rate your current access to journals in your area(s) of study?

Poor Adequate Good   Very Good

☐   ☐   ☐   ☐

Can you name journals, not currently available in the library's collection, that you would like to consult regularly?

_____

_____

_____

_____

2. How often did you turn to print (paper) versions of scholarly journals in the last month?

Daily   Thrice a week   Once a week   Once in 2 weeks

☐   ☐   ☐   ☐

3. How do you rate the importance to your academic work of journals published in Africa compared to those published elsewhere?

	More	Equally	Less
	|_____|_____|_____|		

Give reasons for your answer:

_____

_____

_____

_____

4. How often did you turn to online (electronic) versions of journals in the last month?

Daily   **Thrice a week**   **Once a week**   **Once in 2 weeks**

☐   ☐   ☐   ☐

_____

5. What serial indexes do you consult to find journal articles (indicate if print/online)?

_____

_____

_____

_____

6. What poses the greatest challenge in getting online access to journals you would like to consult?

_____

_____

_____

_____

B. Access to Internet Technology

1. Where do you have access to the World Wide Web?

University Public Home Other

☐   ☐   ☐   ☐

How much, if anything, does this access cost you?

University Public Home Other

_____   _____   _____   _____

_____

2. What are the main purposes for which you use the World Wide Web?

_____

_____

_____

Approximately how many hours did you use the World Wide Web in the last month?

_____

How has your use changed over the last year?

_____

_____

3. What **online** scholarly resources have you consulted in the last month?

_____

_____

_____

_____

_____

4. How could the World Wide Web help you more in your school work?

_____

_____

_____

_____

_____

5. In what ways would you imagine taking advantage of online journals in your field that are "open access" (available free of charge)?

	Very Unlikely _ _ _ _ _ _ _ _ _ Very Likely					
	1	**2**	**3**	**4**	**5**	**Unsure**
Use for preparing course papers	☐	☐	☐	☐	☐	☐
To keep up in the field	☐	☐	☐	☐	☐	☐
To find models and idea for research	☐	☐	☐	☐	☐	☐

C. Resources and Policies

1. How would you rank the following priorities in the university library to your work?

	Unimportant _ _ _ _ _ _ _ _ Very Important					
	1	**2**	**3**	**4**	**5**	**Unsure**
Subscribe to more print journals	☐	☐	☐	☐	☐	☐
Improve access to African journals	☐	☐	☐	☐	☐	☐
Improve access to online journals	☐	☐	☐	☐	☐	☐
Improve access to online serial indexes	☐	☐	☐	☐	☐	☐
Provide more computers and printers	☐	☐	☐	☐	☐	☐
Provide access to computers outside of library	☐	☐	☐	☐	☐	☐
Increase access to the World Wide Web	☐	☐	☐	☐	☐	☐

2. What would be the principal advantages of increasing the number of online journals that are "open access" (available free of charge)?

_____

_____

_____

_____

_____

3. What would be your principal concerns with efforts to increase the number of online journals that are "open access"?

_____

_____

_____

_____

_____

4. If "open access" publishing systems were used in the coming years to do the following five (5) things how would you rank them in importance (1=highest, 5=lowest, or leave items blank if not important)

☐ Increase access to African journals

☐ Increase access to overseas journals

☐ Increase the international indexing of African journals

☐ Improve the chances of publishing in overseas journals

☐ Increase opportunities for publishing new African journals