



## TOWARDS A DEVELOPMENT AND USE OF INTERNET WEB AND INFORMATION COMMUNICATION TECHNOLOGIES FOR VETERINARY MEDICINE EDUCATION IN NIGERIA.

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*ABSTRACT: Various professions, such as accountancy, medicine, engineering and law, have developed and utilized the potentials and capabilities of the Internet in professional education, training, research and practice. This is by utilizing Internet Web Communication Technologies (WCT), the computers/computer networks of various Information Communication Technologies (ICT), and the development of an electronic libraries/resource base.*

*The veterinary profession, over the past decade or so, has also utilized these facilities. However, the development and use of ICT/WCT and electronic libraries for veterinary medicine is mainly limited to the developed countries like the USA, UK and other European countries. It remains, largely an "African Dream". This could be ascribed to the low adaptability/affordability of the Internet culture and a low level of awareness of these electronic facilities in African countries. Nigeria has five officially recognized veterinary faculties, with three others in the offing. The availability of self-owned Internet links by these universities is a recent phenomenon.*

*However, many academics had utilized private commercial Internet facilities, a relatively expensive venture. Thus, none of the veterinary faculties in Nigeria is engaged in corporate utilization of the WCT/ICT facilities in veterinary education. Also, although the theme at the 2001 Congress of the Nigerian Veterinary Medical Association, was "Advances in Information Technology: Impact on the Veterinary Profession", apart from an invited speaker, only one paper, presented by this author, was strictly relevant on the theme.*

*Apart from the low adaptability/affordability and the apparent lack of awareness, there are three major limitations to the development and use of ICT/WCT/veterinary electronic libraries/ resource base in veterinary medicine in Nigeria. These are the need for training/ retraining of veterinary informatics personnel and acquisition of relevant hardware/software, poor power supply and the development of sufficient/relevant local veterinary electronic libraries.*

*The Faculty of Veterinary Medicine, University of Ibadan, which was recently designated a Nigerian Center of Excellence in Veterinary Public Health and Preventive Medicine by the Post-Graduate College of Veterinary Surgeons Nigeria, has the human and intellectual capacity for the application of ICT and WCT to veterinary education and ongoing research in trans-boundary and zoonotic tropical diseases. The Faculty eagerly looks forward to such international collaborative support to overcome existing limitations, in its mission for the application of ICT and WCT to veterinary education, research and practice in Nigeria.*

### **Introduction**

The Internet is arguably one of the most significant technological developments of the late 20th century. Initially conceived in the seventies to act as a nuclear attack resistant method for exchange of scientific information, the Internet was deployed for linking research agencies and universities. Its interactive potential as the Worldwide Web created new opportunities which enabled information communication worldwide. It is now being employed as a tool for learning, teaching and research in many professions at pre- and postgraduate levels in many universities, especially in the advanced countries of Europe and the Americas. Also, a number of websites are

dedicated to veterinary medicine research and education resources

### **Internet use in Africa**

The use of the Internet facilities and opportunities in Africa is still at an abysmally low level. Comparing the performance of Africa with other regions of the world (Table 1), Africa has the poorest Internet performance; the performance is a factor of 30 below that of Europe, for example. Even Uganda (one of the better performing African countries) is at the same state that Europe was at in 1995, and the trends show Africa is falling behind other regions (Cottrell and Canessa, 2003).

**TABLE 1: INTERNET USERS AND POPULATION STATISTICS FOR AFRICA**

<b>AFRICA REGION</b>	<b>Population (2005 Est.)</b>	<b>Pop. % in World</b>	<b>Internet Users, Latest Data</b>	<b>Use Growth (2000-2005)</b>	<b>Penetration (% Population)</b>	<b>% Users in World</b>
<b>Total for Africa</b>	900,465,411	14.0 %	<b>13,468,600</b>	198.3 %	1.5 %	1.5 %
<b>Rest of the World</b>	5,511,601,774	86.0 %	<b>875,212,531</b>	145.5 %	15.9 %	98.5 %
<b>WORLD TOTAL</b>	<b>6,412,067,185</b>	100.0 %	<b>888,681,131</b>	146.2 %	13.9 %	100.0 %

Source: *internetworldstas.com* <http://www.internetworldstats.com/stats1.htm>. Upgraded March 28 2005.

Even within Africa, there are more than an order of magnitude differences in performance between different countries as shown in Table 2 below:

**TABLE 2: INTERNET USAGE STATISTICS FOR AFRICA**

<b>AFRICA</b>	<b>Population (2005 Est.)</b>	<b>Internet Users Dec/2000</b>	<b>Internet Users, Latest Data</b>	<b>Use Growth (2000-2005)</b>	<b>% Population (Penetration)</b>	<b>(%) Users in Africa</b>
<b>Algeria</b>	32,557,738	50,000	<b>500,000</b>	900.0 %	1.5 %	3.7 %
<b>Angola</b>	12,918,595	30,000	<b>41,000</b>	36.7 %	0.3 %	0.3 %
<b>Benin</b>	7,317,178	15,000	<b>70,000</b>	366.7 %	1.0 %	0.5 %
<b>Botswana</b>	1,820,498	15,000	<b>60,000</b>	300.0 %	3.3 %	0.4 %
<b>Burkina Faso</b>	11,998,145	10,000	<b>48,000</b>	380.0 %	0.4 %	0.4 %
<b>Burundi</b>	7,742,727	3,000	<b>14,000</b>	366.7 %	0.2 %	0.1 %
<b>Cameroon</b>	16,983,434	20,000	<b>60,000</b>	200.0 %	0.4 %	0.4 %
<b>Cape Verde</b>	469,489	8,000	<b>20,400</b>	155.0 %	4.3 %	0.2 %
<b>Central African Rep.</b>	4,072,248	1,500	<b>6,000</b>	300.0 %	0.1 %	0.0 %
<b>Chad</b>	8,528,506	1,000	<b>15,000</b>	1,400.0 %	0.2 %	0.1 %
<b>Comoros</b>	650,306	1,500	<b>5,000</b>	233.3 %	0.8 %	0.0 %
<b>Congo</b>	3,403,718	500	<b>15,000</b>	2,900.0 %	0.4 %	0.1 %
<b>Congo, Dem. Rep.</b>	57,261,205	500	<b>50,000</b>	9,900.0 %	0.1 %	0.4 %

<b><u>Cote d'Ivoire</u></b>	19,072,133	40,000	<b>240,000</b>	500.0 %	1.3 %	1.8 %
<b><u>Djibouti</u></b>	767,393	1,400	<b>6,500</b>	364.3 %	0.8 %	0.0 %
<b><u>Egypt</u></b>	69,954,717	450,000	<b>3,000,000</b>	566.7 %	4.3 %	22.3 %
<b><u>Equatorial Guinea</u></b>	1,085,278	500	<b>1,800</b>	260.0 %	0.2 %	0.0 %
<b><u>Eritrea</u></b>	4,125,942	5,000	<b>30,000</b>	500.0 %	0.7 %	0.2 %
<b><u>Ethiopia</u></b>	70,600,043	10,000	<b>75,000</b>	650.0 %	0.1 %	0.6 %
<b><u>Gabon</u></b>	1,398,521	15,000	<b>35,000</b>	133.3 %	2.5 %	0.3 %
<b><u>Gambia</u></b>	1,435,510	4,000	<b>25,000</b>	525.0 %	1.7 %	0.2 %
<b><u>Ghana</u></b>	20,916,973	30,000	<b>170,000</b>	466.7 %	0.8 %	1.3 %
<b><u>Guinea</u></b>	7,988,524	8,000	<b>40,000</b>	400.0 %	0.5 %	0.3 %
<b><u>Guinea-Bissau</u></b>	1,427,685	1,500	<b>19,000</b>	1,166.7 %	1.3 %	0.1 %
<b><u>Kenya</u></b>	33,393,408	200,000	<b>400,000</b>	100.0 %	1.2 %	3.0 %
<b><u>Lesotho</u></b>	2,307,137	4,000	<b>30,000</b>	650.0 %	1.3 %	0.2 %
<b><u>Liberia</u></b>	3,065,594	500	<b>1,000</b>	100.0 %	0.03 %	0.0 %
<b><u>Libya</u></b>	5,980,693	10,000	<b>160,000</b>	1,500.0 %	2.7 %	1.2 %
<b><u>Madagascar</u></b>	17,955,589	30,000	<b>70,500</b>	135.0 %	0.4 %	0.5 %
<b><u>Malawi</u></b>	11,166,595	15,000	<b>36,000</b>	140.0 %	0.3 %	0.3 %
<b><u>Mali</u></b>	10,587,269	18,800	<b>25,000</b>	33.0 %	0.2 %	0.2 %
<b><u>Mauritania</u></b>	2,836,848	5,000	<b>12,000</b>	140.0 %	0.4 %	0.1 %
<b><u>Mauritius</u></b>	1,268,044	87,000	<b>150,000</b>	72.4 %	11.8 %	1.1 %
<b><u>Mayotte (FR)</u></b>	182,075	-	-	-	-	n/a
<b><u>Morocco</u></b>	31,003,311	100,000	<b>1,000,000</b>	900.0 %	3.2 %	7.4 %
<b><u>Mozambique</u></b>	19,416,143	30,000	<b>50,000</b>	66.7 %	0.3 %	0.4 %
<b><u>Namibia</u></b>	1,994,816	30,000	<b>65,000</b>	116.7 %	3.3 %	0.5 %
<b><u>Niger</u></b>	11,925,511	5,000	<b>15,000</b>	200.0 %	0.1 %	0.1 %
<b><u>Nigeria</u></b>	156,468,571	200,000	<b>750,000</b>	275.0 %	0.5 %	5.6 %

<b><u>Reunion (FR)</u></b>	779,388	130,000	<b>150,000</b>	15.4 %	19.2 %	1.1 %
<b><u>Rwanda</u></b>	8,640,104	5,000	<b>25,000</b>	400.0 %	0.3 %	0.2 %
<b><u>Saint Helena (UK)</u></b>	5,110	-	<b>500</b>	n/a	9.8 %	0.0 %
<b><u>Sao Tome &amp; Principe</u></b>	166,657	6,500	<b>15,000</b>	130.8 %	9.0 %	0.1 %
<b><u>Senegal</u></b>	10,694,222	40,000	<b>225,000</b>	462.5 %	2.1 %	1.7 %
<b><u>Seychelles</u></b>	82,494	6,000	<b>11,700</b>	95.0 %	14.2 %	0.1 %
<b><u>Sierra Leone</u></b>	5,182,225	5,000	<b>8,000</b>	60.0 %	0.2 %	0.1 %
<b><u>Somalia</u></b>	11,967,011	200	<b>89,000</b>	44,400.0 %	0.7 %	0.7 %
<b><u>South Africa</u></b>	48,051,581	2,400,000	<b>3,523,000</b>	46.8 %	7.3 %	26.2 %
<b><u>Sudan</u></b>	35,035,677	30,000	<b>300,000</b>	900.0 %	0.9 %	2.2 %
<b><u>Swaziland</u></b>	1,121,937	10,000	<b>27,000</b>	170.0 %	2.4 %	0.2 %
<b><u>Tanzania</u></b>	37,103,500	115,000	<b>250,000</b>	117.4 %	0.7 %	1.9 %
<b><u>Togo</u></b>	5,272,987	100,000	<b>210,000</b>	110.0 %	4.0 %	1.6 %
<b><u>Tunisia</u></b>	10,116,314	100,000	<b>630,000</b>	530.0 %	6.2 %	4.7 %
<b><u>Uganda</u></b>	26,987,700	40,000	<b>125,000</b>	212.5 %	0.5 %	0.9 %
<b><u>Western Sahara</u></b>	320,712	-	-	-	-	n/a
<b><u>Zambia</u></b>	11,015,072	20,000	<b>68,200</b>	241.0 %	0.6 %	0.5 %
<b><u>Zimbabwe</u></b>	13,874,610	50,000	<b>500,000</b>	900.0 %	3.6 %	3.7 %
<b>TOTAL AFRICA</b>	<b>900,465,411</b>	<b>4,514,400</b>	<b>13,468,600</b>	<b>198.3 %</b>	<b>1.45 %</b>	<b>100.0 %</b>

Source: *internetworldstas.com* <http://www.internetworldstats.com/stats1.htm>. Upgraded March 28 2005.

#### **Problems of Internet use in Africa and Nigeria**

Participants from Africa at the 2003 World Summit on the Information Society <http://www.itu.int/wsis> bemoaned the fact that their compatriots lacked computers, training and the economics essential to affording new technology. (Alden, 2004). Although Nigeria has one of the most advanced Internet frameworks in Africa, with a broad bandwidth of 512 kbps to the Internet, this service is one of the most costly and problematic in the world. The problems range from inadequate telephone facilities and connections for affordable Internet use, to the high cost of computers

and the related infrastructure that goes hand-in-hand with it (Oatway, 2004).

A number of problems still plague Internet connectivity and usage in the Nigerian University system. From an existing study result (using the Obafemi Awolowo University as study), it is apparent that Nigeria has poor to bad connectivity. In fact, sites appear to have fewer throughputs than many homes with DSL or dial-up modems in developed countries (Cottrell and Canessa, 2003). Poor social infrastructure, especially erratic power supply, is a major problem in Nigeria.

### **Internet usage in Nigerian universities**

The level of utilization of the Internet for academic research in Nigerian universities has been evaluated in some Nigerian universities. At the Obafemi Awolowo University, Ile-Ife, Nigeria, questionnaires were administered to postgraduate students spanning art and science-based programmes. The results from the analysis of the responses showed that the use of the Internet ranked fourth (17.26 percent) among the sources of research materials. Even then, respondents who use the Internet ranked research materials (53.42 percent) second to e-mail (69.86 percent). The study concludes that the use of the Internet for academic research would significantly improve through the provision of more access points at departmental and faculty levels. (Jagboro, 2003 <http://portal.unesco.org/en/ev.php-URL>).

### **Veterinary education in Nigeria**

There are five existing veterinary faculties in Nigeria

- University of Ibadan,
- Ahmadu Bello University Zaria,
- University of Nigeria Nsukka,
- University of Maiduguri and
- Othman Dan Fodio University Sokoto.

Three new ones at Abeokuta, Makurdi and Umudike are still at the pre-clinical phase.

### **Veterinary education at the University of Ibadan**

Veterinary education at the University of Ibadan began in 1963, in cooperative training with ABU Zaria. It became a fully fledged faculty in 1971 and has so far produced 122 PhD, 15 MPhil, 122 MSc/MVSc, 38 MVPH, 45 MPVM, 8 MSc. (Epizootiology) and 1169 DVM graduates. Recently in 2005, the University of Ibadan Faculty of Veterinary Medicine was rated by the National University Commission of Nigeria as the best in terms of quality and number of teachers, infrastructure and graduates; and is designated a Nigerian Center of Excellence in Post-Graduate Veterinary Public Health and Preventive Medicine by the PostGraduate College of Veterinary Surgeons Nigeria.

Its department of Veterinary Public Health and Preventive Medicine was established in 1975, with responsibility for teaching/research in epizootiology, preventive medicine, biostatistics, jurisprudence, zoonoses, food and meat hygiene, organization of veterinary services, veterinary economics, ambulatory clinics; and has produced 38 MVPH, 45 MVPM, 8 MSc (Epizootiology) and 13 PhDs since 1983

### **ICT/WCT veterinary medicine education in Nigeria**

The application of aspects of ICT/WCT to veterinary research and practice has recently been actively promoted in Nigeria (Babalobi, 2003, Babalobi and Cowen, 2001, Babalobi et al, 2004, Hassan et al, 2004, Libby et al, 2001). Despite this gradual imbibing of ICT and WCT technologies in university education, research and training in Nigeria, none of the five existing veterinary faculties in Nigeria is yet to effectively employ these technologies (especially WCT) in veterinary education.

However, a number of undergraduate and postgraduate students do employ technologies such as Geographic Information System, Global Positioning System and Remote Sensing in tropical disease research (Libby et al, 2001). Multilateral assistance/collaboration is needed to overcome these limitations and actualize this desirable need to develop and apply ICT/WCT and electronic libraries for veterinary medicine education, research and practice in Nigeria.

### **Collaborative partnership**

Partnership with e-learning ICT/WCT facilities is required to develop the use of ICT/WCT for education and research in Nigerian universities. The Nigeria Project is an example of such educational partnership between Emporia State University's School of Library and Information Management (SLIM) in Emporia, Kansas, USA and three peer institutions in Nigeria: Bayero University, Kano; Ahmadu Bello University, Zaria; and the University of Maiduguri. The project was designed to foster communication and collaboration between the faculty and student bodies of partner institutions, thereby enhancing diverse and global perspectives in their programs. Participants on exchange study visits from Nigeria to collaborating partner institutions in the West were exposed to WCT technology and blackboard instructional software for online classes by lecturers, and monitored offline discussions and chats by students. The outreach component of the project entails strengthening the capacity of Nigerian institutions, and local public libraries to support development of civil society in their communities. (<http://nigeriaproject.emporia.edu/>, 2003). In 2002, UNESCO initiated a Japanese funds-in-trust cooperation plan to set up virtual libraries in Nigeria. Given the low capacity utilization of Nigerian university libraries to adequately stock relevant required books and literatures, the idea of the virtual library is to exploit the opportunities in ICT to provide solution to these problems (<http://portal.unesco.org/en/ev.php-URL>, 2003). The virtual library is an opportunity to address the paucity of teaching and research materials in the libraries of institutions of higher education in the country. It would also allow the institutions and local researchers to share their own research outputs with the global community (Ya'u, 2003).

### **ICT/WCT status at the University of Ibadan**

The University of Ibadan ICT recently received a boost as it benefited from a three year (2002-2005) Institutional Strengthening Grant of \$3,000,000.00 from the John D. and Catherine T. MacArthur Foundation. (Three other universities- Ahmadu Bello University Zaria, Bayero University Kano and University of Port Harcourt similarly benefited). A substantial part of the grant was devoted to improved Internet access at the university. In 2003, only 25 officers of the University had access to the Internet through a telephone dial-up service via an Internet Service Provider. With the MacArthur grant, a Campus Area Network, using wireless technology has now connected 650 networks

(of an estimated 820) to the network (The University of Ibadan MacArthur Foundation Grant. Newsletter. Special Edition, January 2005). Even then connectivity problems still occur recurrently at faculty, departmental and desktop outposts.

Also from the MacArthur grant, the University Library is converting its manual database format to electronic format and has acquired relevant hardware and software for electronic access. A VSAT Internet access facility has been installed at the University main campus and a second VSAT will be installed in the University College of Medicine, to meet the demand of the College and serve as back up for the main campus VSAT. The University College Hospital, Ibadan (UCH) has a functional medical library – the UCH Medical Library Resource Centre.

The grant was recently renewed for another three years, with effect from May 2005.

#### **ICT/WCT applications in veterinary epidemiology education**

A recent discussion on the epidemiology@LISTES.UMontreal.CA, an epidemiology e-mail discussion group, broached the issue of the use of the electronic forum WebCT (or similar technologies) for teaching epidemiology via class discussions/discussing a case study, the investigation of an epidemic event (Soubhi Hassan: Thu 10/2/2005 3:11 PM). Incidentally and impressively, an African university, the Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, has similarly advertised a 2005 WebCT Short Course in Community-Based Animal Health, as well as a Web-based MSc. and certificated online modules in tropical animal health, to support continuing professional development. With the collaboration of its partners, it seeks to use “*New technologies, such as the interactive potential of the World-wide Web, to create new opportunities which enable information to be shared more freely and to present educational information in a modern format*” (Gaum 2005).

#### **African dream, vision and mission**

At the Budapest 2003 4ICAHIS (4<sup>th</sup> International Conference of Animal Health Information Specialists), Antoinette Lourens referred to efforts to take the nightmare (Lor, 2001) out of retrieving E-information services for Africa and turn it into a colourful and viable ‘African Dream’ (Lourens, 2003). In this regard, the University of Pretoria’s Veterinary Science Library’s role model e-initiative has extended the learning horizon, making information available to users beyond the campus e.g. private practitioners needing information for continuing professional development purposes, post graduate students (including a disabled student) doing distance learning courses, as well as students in other African countries. (Lourens, 2003).

The Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, in collaboration with Western partners, has caught the vision by blazing the trail with its advertised WebCT Short Courses in Community-Based Animal Health, as

well as a Web-based MSc. and certificated online Continuing Professional Development modules in Tropical Animal Health.

The Faculty of Veterinary Medicine, University of Ibadan, which was recently designated a Nigerian Center of Excellence in Veterinary Public Health and Preventive Medicine by the PostGraduate College of Veterinary Surgeons Nigeria, has the human and intellectual capacity for the application of ICT and WCT to veterinary education and ongoing research in trans-boundary and zoonotic tropical diseases. The Faculty eagerly looks forward to such international collaborative support, in its mission for the application of ICT and WCT to veterinary education, research, and practice in Nigeria.

#### **Conclusion**

In his inaugural lecture of 1983, Professor Olu Longe, the 1<sup>st</sup> Professor of Computer Science at the University of Ibadan, illustrated some similar basic concepts of the native Yoruba Ifa Divination and computer science. He explained that the ancient Yoruba knowledge systems existed, were known and practiced before the 11<sup>th</sup> Century. The same ideas were rediscovered in the West in later centuries and packaged as computer (information) science. (Olu Longe, 1983).

According to Phillip Emegwali, the Nigerian born American scientist credited with designing the world’s fastest computer,

*...We Africans were the first to enter the Agricultural Age, the first to build in stones, the first to pioneer in technology. The Greeks learned our technology and taught it to the western world. Two thousand years later, the West is leaving us behind as it prepares to enter the Information Age and the third millennium. We must hurry to enter the Information Age. Europeans learned our technology, used it to enter the Industrial Age and became more prosperous than we are. They learned to put capital together and mass-produce consumer goods. Unless Africa leapfrogs into the Information Age, the economic gap between Europe and Africa would widen because Europe is about to enter the age. In other words, to catch up, Africa must take two steps for every step Europe takes”.*

(Emegwali, 1997

<http://www.emegwali.com/speeches/igbo/1.html>).

Promoting and implementing the active use of WCT and ICT technologies in the professions (including veterinary medicine) in Africa, with the active collaboration and assistance of our Western WCT/ICT colleagues, will certainly help Africa enter and benefit from the Information Age.

#### **Acknowledgement**

There are a number of international organizations actively involved in the promotion of veterinary informatics and the application of ICT and WCT to veterinary medicine in Africa. Among such organizations is the Animal Health Information Specialists AHIS (UK and Ireland) <http://www.ahis.org>.

The AHIS has as objectives:

1. To bring together all those who are employed or interested in the dissemination of animal health information
2. Foster cooperation and resource sharing
3. Stimulate interest in related matters

The AHIS promotes these objectives by the organization of meetings, discussions and conferences and by the collection and dissemination of information.

This plea/position paper, (and similar ones on this issue), have been presented at one of the international AHIS conferences- the 5<sup>th</sup> International Conference of Animal Health Information Specialists in South Africa, July 2005.

Another important role player is the Technical Centre for Agricultural and Rural Cooperation (CTA) (<http://www.cta.int/>) The CTA was established in 1983 under the Lomé Convention between the ACP (African, Caribbean and Pacific) Group of States and the European Union member states. CTA's tasks are to develop and provide services that improve access to information for agricultural and rural development, and to strengthen the capacity of ACP countries to produce, acquire, exchange and utilize information in this area.

CTA also produces *ICT Update* <http://ictupdate.cta.int/> (a bimonthly printed bulletin), a web magazine, and an accompanying e-mail newsletter. Each issue of *ICT Update* focuses on a specific theme relevant to ICTs for agricultural and rural development in African, Caribbean and Pacific (ACP) countries. Specific CTA ICT/WCT services through its Information and Capacity Development Department (ICDD) <http://www.cta.int/icdd/index.htm>, for strengthening the information and communication management capacities of ACP partners include:

1. Selective Dissemination of Information (SDI) (<http://www.cta.int/about/sdi.htm>)
2. CTA's CD-ROM Programme (<http://www.cta.int/about/cdrom.htm>)
3. Seminar Support Programme (<http://www.cta.int/about/ssp.htm>)
4. Support to non-CTA training schemes ([http://www.cta.int/about/training\\_support.htm](http://www.cta.int/about/training_support.htm))

The presenter of this paper, with some other Africans, benefited from the Seminar Support Programme which is designed to enable ACP nationals to attend regional and international conferences on topics of relevance to their area of work. The programme also helps to ensure that ACP views are expressed at international conferences dealing with agriculture and rural development issues (<http://www.cta.int/about/ssp.htm>).

Finally, the Organizer of 5ICAHIS, the Academic Information Service, Veterinary Science Library,

University of Pretoria has succeeded not only in taking the nightmare out of retrieving e-information and turning it into a colourful and viable African dream, but has diligently and graciously hosted 5ICAHIS and facilitated this presentation.

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