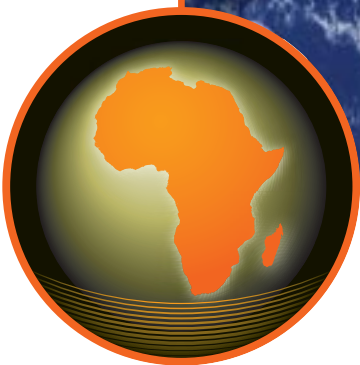# Africa Research Institute

NURSING THE FUTURE
e-Learning and clinical care, in Kenya

By Angela Nguku

The Author

Angela Nguku joined the African Medical and Research Foundation (AMREF) in 2005, while working in Southern Sudan. She was appointed as the first coordinator of the AMREF Virtual Nursing School (AVNS) in 2007.

Angela was born in 1979 in Nthongoni village, Makueni district, in Kenya's Eastern Province. She attended Precious Blood, a provincial Catholic school where she completed her secondary education at age 17. After school, Angela enrolled at the University of Nairobi Medical School to study for a Bachelor of Science in Nursing, where she graduated with honours in 2003.

After an internship at Kenyatta National Hospital, Angela moved to Southern Sudan where she joined Action Africa, a German development charity, in a project to train local health workers in reproductive health. For AMREF, Angela was involved in setting up the the first midwifery school in Southern Sudan, under the auspices of the National Health Training Institute. She was a member of the curriculum development team which introduced an 18-month classroom programme in midwifery. Graduates from the programme are working in health institutions across Southern Sudan.

AVNS is a nursing school established by AMREF in 2007 to improve the clinical and management skills of nurses in Kenya. The aim of AVNS is to develop practical guidelines and to encourage best practice in e-learning programmes administered by nursing schools across the country.

Angela is currently studying for a master's degree in nursing leadership and management, via distance learning, at the University of Dundee, Scotland.

The Policy Voices Series

The Policy Voices Series highlights instances of personal achievement with wider implications for policy makers in Africa.

In publishing these case stories, Africa Research Institute seeks to identify the factors which lie behind successful interventions and to draw policy lessons from individual experience.

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Acknowledgements

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Foreword

Nothing more needs to be said about the promise of information technology to transform developing societies. The precedents are encouraging. Across Africa, cellular phones have brought instant communication to previously isolated villages. Market traders and rural farmers can for the first time gain up-to-the minute pricing from markets and manufacturers in the industrialised world. Internet kiosks, linked via satellite to cyberspace, cater to the growing demand for access to email even from small towns and desolate highways.

The next step is to demonstrate that electronic communication can leapfrog old ways of learning. If that notion is no longer fanciful, it is equally true that much remains to be proved. How, when and where technology can be applied to best effect are questions which invite a dizzying array of ideas and possibilities. Hundreds of distance learning schemes are already underway, with similarly varied results. From the pilot projects of South Africa's Industrial and Scientific Research Council in Pretoria, to Senegalese president Abdoulaye Wade's ambitions for a high-tech university on the Atlantic coast at Dakar, it remains an immense challenge to translate ideas into concrete results.

The *Policy Voices Series* examines the policy implications arising from the experience of innovators in Africa. This paper considers the work of an organisation, chronicling what must be the ultimate test of any distance-learning programme: to achieve new standards of clinical care from hard-pressed nurses on the front line in Kenya's busy hospitals and clinics. Mindful of that challenge, the African Medical and Research Foundation (AMREF) has devised an e-learning programme supported by local instructors in nursing schools and other clinical centres across Kenya. If a computer-based syllabus can be effective in training clinical staff, within stringent criteria regulated by the Nursing Council of Kenya, surely other professions will find much to emulate in their example.

Angela Nguku, coordinator of AMREF's Virtual Nursing School (AVNS), shares many of the characteristics of the nurses who are her students: she is a busy, practical, no-nonsense kind of teacher. For Angela, much of the talk of 'designer' technologies for Africa is exaggerated. She has no time for the fantasies of science fiction. AVNS, created in 2007, is both a laboratory and an incubator for the ongoing experiment that is e-learning in Africa. Its electronic content avoids the costs and administrative burden of textbooks, but follows the same syllabus as traditional classroom teaching, set by the Nursing Council of Kenya. The basic premise of e-learning for clinical practitioners, then, is more organic evolution than a radical break with the past.

In common with every African nation, Kenya is severely affected by a shortage of clinical skills to tackle the epidemics of the 21st century. Most of the country's 22,000 'enrolled' nurses – the standard minimum nursing qualification in Kenya – received their training before they were called on to treat complications and diseases arising from chronic conditions such as HIV/AIDS, malnutrition and poor sanitation in urban slums.

The dimensions of the problem are well understood by the ministry of health and the Nursing Council of Kenya. In 2001, they adopted a policy intended to upgrade the clinical skills of the country's enrolled nurses – then estimated at 26,000 – to the higher standard of a 'registered' nurse by 2010. The estimated number of enrolled nurses was subsequently revised to 22,000. A related plan to phase out the basic qualification for enrolled nurses has not been pursued. For AMREF, however, the objective is unchanged: an e-learning programme to deliver a high output of trained nurses in a short period of time. Close links to physical infrastructure enable nurses to train while continuing in full-time work at hospitals, health centres and dispensaries.

The e-learning methodology is recognised by the ministry of health and regulated by the Nursing Council of Kenya. Both institutions are represented on the

steering committee which oversees distance learning. AMREF secured financial and technical support from Accenture, the global management consulting, technology services and outsourcing company, building on AMREF's record in medical education and Accenture's commercial experience in e-learning and software design. The partnership unlocked about US$3m in financial and technical support from Accenture and Accenture Foundations – a record commitment both in cash terms and in the scale of *pro bono* contributions from technical staff. Accenture created bespoke teaching materials and technical infrastructure to support successive versions of the programme from its launch in September 2005.

For student nurses, AMREF's course can seem daunting. Resistance to technology – sometimes verging on "technophobia," according to Angela – proved a frequent obstacle. Students are offered training in basic computer skills – a mandatory requirement for all applicants. Anne Kamene, a nurse who relates her own story in these pages, first set hands on a computer at AMREF: "I'm not computer literate, but I can use a computer to run the programme," she recalls. After countless delays, AMREF's goal of supplying one laptop per student is now in prospect, helped by an arrangement to import discounted second-hand laptops from Computer Aid, a UK charity.

Improved access to computers is crucial to realise the chief advantage of e-learning, namely the prospect of achieving far greater reach by increasing the ratio of student nurses per tutor beyond the classroom maximum of 20:1 stipulated by the Nursing Council of Kenya. For AVNS, this quota has been increased to 50:1 – a significant concession, but also a measure of caution on the part of the regulatory authority. Dr Peter Ngatia, AMREF's director of capacity building, is optimistic that in the longer term, as the pedagogy is refined, a ratio of more than 50 students per tutor can be achieved.

A larger and so far intractable deterrent is the cost of tuition. The two-year programme to qualify as a registered nurse costs each student about US$1500. Average salaries for an enrolled nurse are in the range of US$100-US$250 per month, dependent on employer, experience and location. Most nurses in Kenya work either within the public sector, private or faith-based institutions. For nurses such as Anne Kamene, a single mother of two with no savings and an elder child already at university, more professional training involves a massive investment. Nor is there any guarantee of better rates of pay for registered nurses. In common with other African states, Kenya lacks both resources and appropriate structures adequately to remunerate improved skills. Most graduates have waited, often several years, for a pay rise.

As this paper goes to press, about 600 Kenyan nurses have qualified via e-learning, with a further 5,798 in training to become 'registered' nurses. Only a portion of these will complete their studies via e-learning, supplemented by periods of clinical training in teaching hospitals and other centres of care. The incidence of failure and of drop-outs from the e-learning course remains worrying high, both for its architects at AMREF and for the ministry of health and the Nursing Council of Kenya. In spite of these problems, however, their work begins to address the serious shortage of up-to-date clinical skills among nurses in Kenya.

The precedent is both important and, in a larger sense, inadequate. Tackling the problem of outdated skills does not, of course, target the more formidable issue of the general shortage of nurses in every African country – although the precedent of successful e-learning may yet play a part in making good that deficit. AMREF's methodology has provoked interest from neighbouring countries in East Africa, from Rwanda, and parts of southern and West Africa: all regions where technological infrastructure is limited and unreliable, but vested with the high hopes of local communities. "E-learning is a big

step in the right direction for Kenya," says Elizabeth Oywer, registrar of the Nursing Council of Kenya.

In a recent survey of graduates from the AVNS programme, 20 out of 27 respondents expressed enthusiasm for migrating to a better paid job abroad. According to most estimates, Kenya will not meet any of the Millennium Development Goals for health by 2015 – goals adopted by the United Nations and G8 group of industrialised countries, and backed by funding commitments scheduled to reach US$50 billion a year for Africa. As skilled health professionals seek better paid roles in developed countries, innovations such as e-learning may gain new significance in the ongoing debate over development policy.

The policy implications of e-learning are not confined to Africa. In a global village, international relations require constant negotiation. Already, high speed data connections link African companies to new clients in the higher-waged-metropolitan centres of the rich world. A fledgling industry of new call centres and administrative offices – 'back office processing', in corporate jargon – has taken root from Cape Town to Kampala. If such cooperation can work in business, why not in the public realm – most especially in education and skills training?

These are early days still for AMREF's e-learning programme, but the record to date raises the possibility of a viable mechanism for reparations to make good the loss of skilled migrants from African health systems. Industrialised nations could yet subsidise the cost of replacing lost skills by training one new nurse for every (tax-paying) migrant to a hospital in Europe or the United States – a quid pro quo which might provide a model for other sectors struggling to replace local skills lost to the 'brain drain'.

It may even emerge, as early evidence from Kenya suggests, that a training method which enables nurses to continue to live and work in local communities will, in turn, reduce their enthusiasm to leave family and other

social networks after graduation. International policy makers should look hard at the precedent, and its prospects.

Mark Ashurst
Director, Africa Research Institute

1. Introduction

In 2003, after a four-year course at the University of Nairobi Medical School, I graduated with a Bachelor of Science in Nursing. The syllabus had been designed as a five-year programme of study, but was condensed in an effort to boost the number of skilled nurses in Kenya. Our work was concentrated into an extended academic year spanning 44 weeks. At weekends, I found a part-time job to cover my living expenses. A higher education loan from the bank paid for tuition fees and accommodation costs.

Since completing my degree, I have seen the extraordinary investment and sacrifice made by many students of nursing – in Kenya, and further afield. Much of my career has been spent educating other nurses. In early 2005, I travelled to Southern Sudan to carry out a survey of maternal and reproductive health for Action Africa Help International, a German charity. Subsequently, we implemented a programme to reduce maternal mortality, in which I trained Sudanese health workers to build local skills and capacity. The experience convinced me of the huge difference which improved clinical care can make, from the earliest stages of human life.

In Sudan, I joined African Medical and Research Foundation (AMREF), Africa's largest non-governmental organisation (NGO) in the health sector. I worked in a team which set up the first midwifery school at the National Health Training Institute in Southern Sudan. My first hands-on experience of devising training programmes was to develop an 18-month course in midwifery for nurses.

In 2007, I returned to Nairobi to take up a new position with AMREF as course coordinator for the new AMREF Virtual Nursing School. AVNS is part of an innovative nationwide e-learning programme pioneered by AMREF. Other health institutions participate in the programme, and AVNS is one of 32 nursing schools in Kenya which offer e-learning programmes. We try to be an incubator for innovation and best practice, from which practical guidelines for e-learning can be developed and shared with other schools. AVNS is administered and funded entirely by AMREF.

Our e-learning programme was developed initially by my colleagues at AMREF in partnership with Accenture, a global management consulting, technology services and outsourcing company.[1] The advantage of e-learning is its potential to train a high number of nurses in a short period of time. Nurses with the most basic level of training, an Enrolled Community Health Nursing Certificate, are able to upgrade the theoretical component of their training to the level of the Registered Community Health Nursing Diploma, without attending classes or leaving their jobs. Course materials can be loaded from DVD onto any computer. Students can follow the course in their own time, supported by tutors who monitor their progress remotely.

Prior to 2005, when the first distance learning schemes were introduced for nurses, many would-be students were deterred from studying for a higher nursing qualification because they lived too far from a nursing school. The traditional classroom-based schools were able to train a maximum 150 registered nurses each year, making little impact on Kenya's huge deficit of skilled medical staff. By 2009, the combined capacity of Kenya's various institutions and initiatives to train registered nurses had reached almost 600 per year. The rate of increase is slow, relative to the need, but we are making progress.

2. A system under strain

The Kenyan health sector is ill-equipped and under-staffed to meet the needs of a population which has doubled in size since 1980. The HIV/AIDS pandemic places a heavy burden on the system: AIDS-related conditions are the country's biggest killer, accounting for 38% of all deaths in Kenya each year.[2] Respiratory infections, diarrhoeal diseases, tuberculosis and malaria

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1. References to Accenture include Accenture Ltd and its subsidiaries as well as independent charitable organisations that bear the Accenture name.
2. World Health Organisation, www.who.int/countries/ken/en/ Accessed June 2009

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claim a further 27% of annual deaths, although in a vast majority of cases these conditions are treatable. The key measures or health indicators in Kenya remain better than those of many other sub-Saharan African countries, but they are deteriorating. Predictions by Britain's Department for International Development (DFID) indicate that Kenya has very little or no chance of achieving any of the Millennium Development Goals in health by 2015.[3]

Most patients are required to pay for treatment. Spending on public health is equivalent to approximately US$5 per capita – well below the US$20 often cited as a bare minimum to deliver essential services. Government institutions provide free care for only the most basic medical procedures. Any more specialised treatment invariably incurs a charge. Although most private health institutions have a good reputation for their standards of care, they tend to be costly and beyond the reach of most Kenyans. Faith-based and charitable institutions often provide cheaper health services than the private sector, subsidised by donations, but their services are rarely free of charge.

The quality of care varies greatly from urban to rural areas. Rural health facilities tend to be smaller, and are usually limited to clinics or dispensaries. Most lack capacity in both skilled personnel and medical equipment. When staff encounter complicated illnesses, they refer patients to a larger hospital in an urban area. About 60% of nurses work in rural areas. Most are enrolled nurses, trained to perform only basic procedures.

3. The skills shortage

The standard and scope of care is constrained by a shortage of skilled health workers. Kenya counts about 33,000 nurses, in a population of just under 35 million. That is equivalent to around one nurse for every 1000 people. In the UK, the equivalent figure is just short of 13 nurses for every 1000 people. [4]

Two thirds of the nurses in Kenya hold only an enrolled nursing certificate, the minimum nursing qualification. Many enrolled nurses completed their training before HIV and tuberculosis became widespread. They are not trained in the management of infectious diseases. The curriculum for the enrolled nursing certificate is outdated. It has not kept up to date with developments in nursing practice and disease management.

At any one time, up to 60% of public hospital beds in Kenya are occupied by HIV/AIDS patients – yet most Kenyan nurses have no training in diagnosis and management of their condition. The World Health Organisation has identified the "acute shortage of trained health workers, especially in rural areas" as one of the largest barriers to improving care for people infected with HIV.

Enrolled nurses are trained in basic midwifery, but they are not taught how to manage complications during childbirth. The rate of maternal mortality is high and rising in Kenya. About 15% of women aged 15-40 die during childbirth.

4. A hierarchy of training

Training as an enrolled nurse is the quickest and cheapest of three routes to becoming a nurse in Kenya. Two alternative courses – Bachelor of Science in Nursing, and the registered nursing diploma – take longer to complete, with no guarantee of higher wages. In 2005, 66% of Kenyan nurses held an enrolled nursing certificate. Only 6% held a degree.

The enrolled nursing certificate takes two and a half years to complete. Training includes general nursing, community health and basic midwifery. Nurses learn to manage discomfort, to feed and bath patients, to hand out prescribed medication, and to assist doctors during minor surgical procedures.

Enrolled nurses are required to act only when instructed by doctors and senior nurses. They can administer

3. *Three year plan for Kenya*, 2004, UK Department for International Development, www.dfid.gov.uk/Where-we-work/Africa- Eastern–Southern/Kenya1/
4. World Heath Organisation, www.who.int/countries/gbr/en/

medication prescribed by doctors, but they are not taught about the rationale behind doctors' prescriptions. Why is this medication necessary? What is a safe dose to take? What are the side effects? They rely on registered nurses or doctors to answer these questions.

The registered nursing diploma takes three and a half years to complete and prepares students for all aspects of clinical care. It is a much more expensive course for students. Registered nurses can obtain senior positions in hospitals and health centres, but often do not receive better wages than enrolled nurses. In 2005, there were only 4,000 registered nurses employed in Kenya.

The registered nursing diploma includes training in specialised medical fields, such as mental health and infectious diseases. Registered nurses learn to conduct research into new and re-emerging medical conditions. They acquire a variety of management skills, from coordinating hospital staff to developing filing systems for patients' medical records. Once qualified, they are authorised to manage hospital wards.

The Bachelor of Science in Nursing, the highest qualification, takes five years to complete, including a one-year internship. The Bachelor was introduced by the Nursing Council of Kenya (NCK) in 1994 as a response to the shortage of highly skilled nurses and teachers. The government needed to train as many nurses as possible to degree level.

The Bachelor of Science in Nursing is unlike any other nursing qualification. It is a comprehensive course, under which student nurses are required to gain a minimum of 62 weeks of clinical experience in the principal areas of care, namely:
• Anatomy and physiology
• Pharmacology and biochemistry
• Virology and immunology
• General nursing and specialised nursing disciplines
• Community health
• Midwifery and reproductive health

The degree course is expensive, but provides nurses with an array of career options, which extend beyond clinical care. Degree nurses are trained to be hospital managers, teachers and researchers. These skills are crucial because senior nurses assume a leading role in the provision of clinical care in Kenya. They support doctors in clinical areas, while also taking responsibility for the management of hospital wards.

5. The challenge: 22,000 nurses, nine years

In 2001, the Nursing Council of Kenya (NCK) and ministry of health (MOH) issued a joint statement announcing their intention to train all enrolled nurses in Kenya to the higher standard of registered nurse by 2010.[5] At that time the number of enrolled nurses in the country was estimated at 26,000, but was subsequently revised to 22,000. The statement acknowledged a need to improve and to standardise the quality of clinical care provided in health institutions. The Kenyan authorities acknowledged that the basic qualification of enrolled nurse failed adequately to prepare nursing staff to confront the country's emerging health problems.

The NCK, the body mandated to oversee the training of all nurses in Kenya, was aware that it would not be able to reach the target alone. The capacity of nursing schools was limited. They could train only between 100 and 150 enrolled nurses to the standard of registered nurse each year. To achieve its goal of training 22,000 enrolled nurses in nine years, the NCK would need to train about 2,450 nurses each year.

The NCK turned to AMREF, Africa's largest health non-governmental organisation, for help. AMREF has experience in designing education programmes, particularly distance learning, in several African countries, coordinated from our headquarters in Nairobi. One of AMREF's main objectives is to strengthen the capacity and capability of health institutions in Africa.

5. Under the coalition government formed in 2008, the ministry of health has been divided into two separate ministries: ministry of medical services and ministry of public health and sanitation

The scale of the challenge was daunting. AMREF had never designed a programme of this magnitude before. It was clear that it would not be possible to train all 22,000 nurses in classrooms. Kenya does not have enough nursing schools, teachers or training hospitals to sustain a large classroom-based programme.

Most nursing schools are located in urban centres or small towns, but most enrolled nurses live in rural areas. They are not always in a position to commute to a school, particularly where transport infrastructure is poor. Nor can most nurses afford to take two years out of work to return to education. Nurses who wanted to return to nursing school often transferred to an urban area, where they could continue to work while studying.

6. Distance learning

It soon became evident to my colleagues at AMREF that the only prospect of achieving the target set by the NCK and the MOH was to adopt distance learning. In 2003, AMREF designed a programme to train enrolled nurses remotely. The course is available through nursing schools, but there are no classroom lessons.

Nurses follow four textbooks – one for each of the course modules, which guide nurses through the theoretical requirements of the registered nursing diploma. The four modules cover all subjects required by the NCK curriculum:

- First module: general nursing, paediatric and adult clinical care.
- Second module: reproductive health, midwifery, sexually transmitted diseases and contraceptive technology.
- Third module: community health, community needs assessments and infectious disease treatment.
- Fourth module: specialised nursing areas, mental health care, management training, research and teaching methodologies.

Face-to-face interaction has not been abandoned. Although distance learning eliminates much of the methodology of the classroom, the e-learning programme includes opportunities for students to meet with their teachers. Nurses are required to attend school for two weeks of tutorials for each module. If nurses have difficulties with an aspect of the course, they can visit a distance learning tutor at the nursing school. Nurses complete a mandatory 48 weeks of clinical experience at the closest teaching hospital.

The distance learning programme substantially increased the intake of enrolled nurses studying for a registered nursing diploma. By June 2004, 570 students had been admitted to the course, a five-fold increase on admission to the NCK classroom programme.

The textbook-based distance learning programme had moved Kenya a long way towards overcoming the difficulties associated with further education for working nurses. Although I was not involved in this aspect of AMREF's work, I can appreciate its important achievements:

- No regular classroom lessons; nurses are not required to leave their jobs and become full-time students.
- Access for nurses from rural areas; nurses are required to attend nursing school only intermittently.
- Flexibility; textbooks enable nurses to study at home in their own time.
- Clinical practice; students practise clinical care in their daily work by applying skills learned from their training.

7. The burden of print

The distance learning programme is burdened by the cost of textbooks. The ministry of health does not provide extra funds to meet the cost of additional textbooks. The cost of printing has deterred nursing schools from participating in the programme.

e-Learning: key dates

2000: Nursing Council of Kenya (NCK) holds talks with the ministry of health (MOH) to discuss the shortage of skills among enrolled nurses.

2001: NCK and MOH release joint statement acknowledging the urgent need to retrain 26,000 enrolled nurses to the standard of registered nurse, by 2010. (Subsequently revised to 22,000)

2002: NCK approaches AMREF for assistance in designing a programme to retrain all of Kenya's enrolled nurses.

2003: AMREF designs a distance learning programme based on printed textbooks.

2004: AMREF approaches Accenture for assistance in designing an e-learning programme for enrolled nurses.

2005: Accenture agrees to provide funding and technical support to developing an e-learning programme. The pilot project begins in September.

2006: Nationwide e-learning begins in March, with participation of 32 nursing schools.

2007: AMREF Virtual Nursing School (AVNS) is founded. Based at AMREF headquarters, AVNS focuses only on e-learning for enrolled nurses.

2010: Accenture funding worth US$1.9 million due to expire.

Printed textbooks are difficult to improve and update. If the learning material needs to be changed, new textbooks have to be printed. The NCK reviews the curriculum for nursing education every four years. Since the beginning of the programme in 2003, AMREF has made suggestions to the NCK for improving the registered nursing curriculum. It is difficult, logistically and financially, to print new textbooks each time the curriculum is updated or changed.

Many nursing schools continue to run print-based distance learning programmes. They find the methodology allows greater flexibility than classroom learning, although many rural nurses have not heard of distance learning. In September 2004, admissions dropped to 95, from 570 in the previous year. In March 2005, the tally of admissions rose to 280, still only half the intake of the first year. It became clear that these courses would not train sufficient nurses to meet national targets. AMREF began to explore alternative ways to expand the distance learning programme.

8. A bright idea

In 2004, AMREF began to consider electronic teaching methods, or e-learning, as an alternative to textbooks. The idea of developing a computer-based e-learning programme for the registered nursing diploma originally came from South Africa. Dr Peter Ngatia, head of capacity building at AMREF, told a colleague at the University of Pretoria in South Africa about the difficulties AMREF had experienced in devising a distance learning programme to address the scale of the skills deficit among Kenyan nurses.

The University of Pretoria has developed a master's programme for public health workers through e-learning. Students download course material from the internet to study in their own time. Three thousand students were registered on the programme in 2004, demonstrating that e-learning could support large number of public health workers in training at the same time.

The application of the e-learning model in Kenya was far from straightforward, as I would subsequently discover in my work to set up a dedicated AMREF Virtual Nursing School (AVNS). The idea of training nurses through computers is a totally new concept. No public policy existed to support e-learning initiatives. Kenya has poor electricity and internet connectivity, particularly in rural areas. For all its achievements in public and community health, AMREF had no experience in computer-based education and lacked technical skills to develop an e-learning programme.

9. Accenture

Fortunately, help arrived in the form of Accenture, the business consultancy and technology services company, which has contributed both technical skills and financial resources to roll out a computer-based programme across the country.

We turned to Accenture on the advice of Matthew Edwards, a director of AMREF UK, who is also a senior executive at Accenture. With his assistance, AMREF's main fundraising office, in London, worked closely with my colleagues in Nairobi to prepare a fundraising proposal. The proposal was submitted to the Corporate Citizenship Council of Accenture, which reviews all applications for charitable funding.

In 2005, Accenture agreed to become a partner in the programme. A cash contribution was made available by Accenture Foundations, the company's charitable trust funds. Accenture Learning Services, a commercial branch of the company, provided IT support and management expertise.

10. e-Learning

The computer-based training methodology was launched in 2005, with a one-year pilot programme based on the first of the four distance learning course modules. Accenture developed the software for the pilot study which involved 145 students from four teaching centres, namely:

- Moi Teaching and Referral Hospital Training College, Rift Valley Province.
- Mombasa Medical Training College, Coast Province.
- St Elizabeth Nursing School, Mukumu, Western Province.
- Kakamega Medical Training Centre, Western Province.

While the pilot study was under way, the electronic content for the remaining three modules was developed jointly by Accenture and AMREF. Two AMREF staff members, and a representative from the NCK, travelled to the UK for training by Accenture Learning Services in computer programming. Two Accenture staff came to Nairobi to work with a team from AMREF to develop learning materials. From this process, AMREF staff have acquired the skills to develop our own content for e-learning.

Computer-based learning follows the distance learning model but cuts out the paper. Course materials such as nursing theory are loaded into software which can be accessed by student nurses in their own time. Computer 'labs' are set up at nursing schools and other health facilities. AMREF will set up a computer lab for any health facility where at least five nurses want to join the programme. Nurses on to the e-learning course are permitted entry to any computer lab in the country.

The software can be run on a personal computer without an internet connection. In the long term, I am keen to see the entire programme made available online. This would allow a greater number of nurses to train simultaneously, but it is not a priority at this stage. Internet connectivity is not yet sufficiently widespread: only 5% of Kenya has internet coverage, mostly in urban areas.

Kenya, distribution of training centres and nursing schools

Source: AMREF
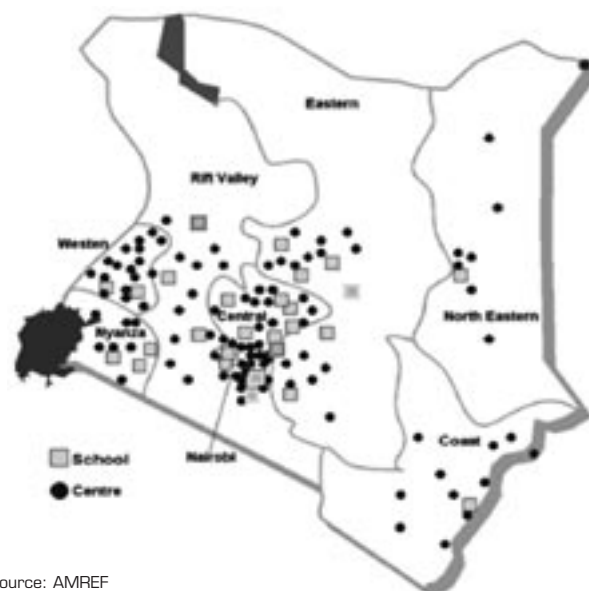
Accenture and AMREF

By Matthew Edwards
Senior executive in financial services, Accenture Ltd

I have a long and personal relationship with AMREF. I spent much of my childhood in Africa, as my father worked for the UK's Overseas Development Agency, the predecessor to the Department for International Development. Over the past four years, I have facilitated the relationship between Accenture and AMREF.

My father approached me, in 2004, with the idea of developing an e-learning programme to train Kenyan nurses in full-time employment. He was aware of AMREF's efforts to train nurses from his role on the charity's board of trustees. I was immediately interested, as the programme seemed to be an excellent fit with Accenture's corporate citizenship objectives.

Corporate citizenship has become an increasingly important part of Accenture's way of doing business. In 2001, Accenture became a publicly listed company on the New York Stock Exchange and a number of former senior partners decided to donate shares to the Accenture Foundations, to fund a Global Giving Programme. Accenture takes corporate citizenship very seriously.

As always, Accenture needed to understand the feasibility of the programme. We sent two employees, who were familiar with Accenture's e-learning capabilities, to Nairobi to hold a workshop with AMREF and the Nursing Council of Kenya (NCK). Once we were confident that the programme was possible, a funding proposal was developed. My colleagues and I worked with AMREF to develop a proposal for the Accenture Foundations.

In 2005, the Accenture Foundations agreed to support the e-learning programme with US$1.7 million in cash. Accenture agreed to provide a further US$1.2 million in *pro bono* services, primarily for the development of the e-learning software. Accenture Learning Services, the company's e-learning specialists, agreed to provide personnel for the programme development. It took a year to develop a fully functional e-learning programme that could be used to train nurses.

e-Learning for Kenyan nurses is a pioneering programme for Accenture. It is our most ambitious programme in terms of the scale of the cash grant and the level of employee involvement.

Accenture and AMREF don't have a traditional donor-recipient relationship. It has been a partnership between the two organisations, each working on our respective strengths. At Accenture, we have the skills to develop e-learning software. AMREF did not. But the programme would never have been possible without AMREF's expertise in training medical professionals in Africa, and managing complex relationships with the Kenyan government.

There have been challenges along the way but, working jointly with AMREF, we have addressed them. We are all pleased with the progress made in improving nursing training in Kenya.

If nurses have difficulties with the course material, they can seek help from tutors at nursing schools. As in the print-based distance learning programme, students are expected to attend nursing school for two weeks of tutorials per module.

Clinical experience is a key component of the training and is planned at the beginning of each course. Nurses who work at small health centres are given clinical placements at the closest teaching hospital. Replacement nurses are sent to cover for their absence, as the rural services are often short-staffed.

11. Growing pains

Four areas of difficulty emerged from the pilot study, although the overall findings encouraged AMREF to pursue the project. The core areas of concern included:

1. Computer literacy: the programme assumed that tutors and students would be able to adapt to e-learning. Most tutors and students had never used a computer before, lacking the most basic IT skills. Student nurses were not visiting the computer labs on a regular basis.

2. Tutor scepticism: tutors were doubtful that computers could be used to train nurses. These nurses had been teaching for more than 20 years in a classroom. From

their perspective, computers were for young people. The transition from classroom teacher to an e-tutor is an uncomfortable behavioural change for many senior nurses.

3. Technical faults: computer labs regularly experienced technical problems which neither the students nor the teachers could fix. Computers would be sent back to Nairobi for repair with only minor problems, which would have been avoided if nurses had basic IT training. By the time replacement computers were sent to the computer labs, students had fallen behind in their studies.

4. Clinical congestion: teaching hospitals were beginning to experience congestion in clinical areas. The registered nursing diploma requires nurses to complete relevant clinical assessments for each module. Nursing schools encountered difficulties in finding clinical placements for the increased number of enrolled nurses on the e-learning programme. The number of teaching hospitals approved for training purposes is limited. Clinical placements in teaching hospitals are in high demand from all medical students, not just nurses.

12. Responses

The scepticism of tutors and the difficulties of student nurses in the pilot study were caused largely by poor computer literacy. Most Kenyans are not familiar with computers. Nurses did not make best use of the computer labs during the study, because their IT training was limited.

In response, AMREF now hosts one-week IT training sessions for e-learning tutors every March and September. The sessions cover a broad range of IT skills: from how to switch on a computer, to fixing minor technical faults. When a new class of nurses enrols on the e-learning programme, tutors spend the first week teaching them IT skills.

Basic IT training has served two main functions:

1. Increased the total time spent by student nurses in the computer labs.

2. Convinced older nurses of the merits of the e-learning methodology.

The problem of technical faults experienced in the pilot prompted AMREF to develop a three-tiered system of IT support. Technical faults are first seen by e-learning tutors, trained in IT support. If tutors cannot fix the computer, the problem is referred to an IT specialist stationed at nursing schools. We have trained an IT specialist for each nursing school which participates in e-learning. If the problem persists, the computer is sent for repair to an IT helpdesk at AMREF headquarters in Nairobi. To date, we have dedicated three IT technicians to the e-learning programme. All matters that cannot be resolved by the schools or AMREF are referred to Accenture.

13. Clinical congestion

We are making ongoing efforts to increase the availability of clinical placements. NCK guidelines state that student nurses must undergo 48 weeks of clinical training to fulfil the requirements of the course. The only way to ensure enough clinical places for student nurses is to increase the number of approved teaching hospitals.

The NCK agreed to review the status of health facilities all over the country, particularly those in rural areas. In the last four years it has approved more facilities for teaching proposes, boosting the number of clinical placements available for nurses. Some health facilities are approved for teaching purposes only in specialised fields, such as paediatrics.

In spite of these initiatives, clinical congestion remains an ongoing problem. Simply put, there are not enough teaching hospitals in Kenya to realise the ambition of the various training programmes. Student nurses, particularly

those in rural areas, often struggle to find clinical placements in nearby hospitals. It can take months for the NCK to determine whether a health facility is fit for teaching purposes.

14. The next hurdle

Nursing schools continue to experience problems with the e-learning methodology. Some are common to all nursing schools, while others emerge only in a particular region or institution.

AMREF does not have ready-made answers to these problems. This is the first time an e-learning programme of this scale has been attempted in Kenya. There is no definitive programme to which we can refer for guidance. Many of the challenges faced by nursing schools are unique to developing countries. I often find that it takes time to work out solutions.

AMREF decided to develop a system for testing responses to problems encountered by nursing schools running the e-learning programme. Significant responsibility for developing this system was assigned to me, in my new role as coordinator of AVNS. We want to be confident in the outcome of any recommendations we make to the schools, because their implementation often involves a financial commitment. Nursing schools are not in a position to take financial risks, and must be prudent in managing their finances.

15. AMREF Virtual Nursing School

The AMREF Virtual Nursing School (AVNS) was established in January 2007 to develop practical solutions to new and persistent challenges. Based at AMREF headquarters in Nairobi, AVNS is a nursing school which trains enrolled nurses through e-learning. It receives no government funding and is solely administered by AMREF. No other medical training programmes are taught at AVNS.

AMREF collects feedback twice a year from each nursing school in the e-learning programme. My role at AVNS is to develop and test solutions to ongoing problems with the e-learning methodology. From this work, we are able to develop useful guidelines for future practice.

We report our findings to the nursing schools, detailing what has worked for AVNS and what has not. The AVNS team make suggestions to nursing schools based on their individual circumstances. AMREF is constantly looking to improve the e-learning methodology.

AVNS has a bi-annual intake of fifty student nurses from all over the country, in March and September. Four tutors are dedicated to the e-learning programme at AVNS, including myself. AVNS is unique in being the only nursing school in Kenya that is not attached to a teaching hospital. All AVNS student nurses are required to complete clinical placements in approved health facilities, although placements are dependent on availability.

16. Partnerships

My first task at AVNS was to find clinical placements for all of our student nurses. In 2007, AVNS reached agreement with the ministry of health (MOH) to allow our student nurses to book clinical placements in any government teaching hospital. Kenya Medical Training College, for example, is the largest government medical school in Kenya, with a large training hospital in Nairobi and 32 smaller training centres across the country. AVNS students can book clinical placements in any of these training hospitals.

The development of partnerships with outside health facilities is paramount in the work of AVNS. We have developed individual partnerships with private and faith-based teaching hospitals in Nairobi and other parts of the country. These partnerships have greatly increased the number of clinical placements on offer to AVNS students.

The NCK and e-Learning

By Elizabeth Oywer
Registrar
Nursing Council of Kenya

Kenya's health system has come a long way over the last 50 years. We have developed our own systems for training all types of health professionals, from scratch. This process has taken longer than we anticipated, particularly in nursing.

Kenya began to train senior nurses in administration, teaching and management in 1968. Until then, nurses had to travel abroad to learn these important skills. But progress has been slow. The Bachelor of Science in Nursing degree was only introduced in public universities in 1994, some 20 years later than was initially planned.

The Nursing Council of Kenya (NCK) is mandated to regulate nursing care and practice in Kenya, but our capacity to train senior nurses is low. In 2005, there were only 4,000 registered nurses and 2,000 degree nurses. Today, I can count the number of nurses with PhDs on one hand.

The lack of training capacity explains why the vast majority of nurses in Kenya hold only an enrolled nursing certificate, the basic nursing qualification. Clinical training for enrolled nurses is brief, and does not include teaching, management or research. Important medical skills, such as midwifery, are not taught in adequate detail.

Enrolled nurses need to be taught clinical and management skills. I joined the NCK in 2003, two years after the council had set a target to re-train all enrolled nurses by 2010. Nursing schools had the capacity to re-train only between 100-150 enrolled nurses each year. It was essential to shift to remote learning because it would have been impossible to meet our target by the traditional classroom method.

e-Learning is an innovative way to train large numbers of nurses. Most importantly, it allows nurses to remain in full-time employment while they study. e-Learning is a big step in the right direction for Kenya. Technology is playing an increasingly important role in the development of the modern world. We want to be a part of that.

When I presented the idea of e-learning to my colleagues at the ministry of health (MOH), they were immediately sceptical. Their main concerns were:

• Low level of computer literacy among nurses
• Poor infrastructure in rural areas
• Increased strain on health institutions

I was determined that the e-learning programme would succeed. We did not have all the answers, but I decided we would learn as we went along. I believe it is important to take risks. I personally made sure that the programme was approved within the NCK and MOH. Today, the numbers speak for themselves: more than 5,000 nurses are training for a registered nursing diploma.

The e-learning programme is a work in progress. Capacity could be improved in important ways, including:

• Helping nurses to pay tuition fees. Nurses are required to pay about US$1,500 to participate in the e-learning programme, an expense that many cannot afford. Tuition fees have been a real barrier for nurses wanting to enrol on the e-learning programme.

• Increasing the number of teaching hospitals. Nurses are struggling to find placements for clinical assessments. The NCK visits ten hospitals every quarter, but ensuring they are fit for teaching purposes is an arduous process.

• Increasing the number of computers available to student nurses. Currently, there is one computer for every five nurses. In an ideal world, each nurse would have their own laptop, so he or she could study at home and at work.

The first concern for the NCK is to ensure that every registered nurse is trained to the highest possible standard. The size of classes must be regulated. AMREF wants to increase the student to tutor ratio from 20:1 to 50:1, in order to at least double the number of nurses in training at any one time.

I welcome efforts to increase the number of nurses in training, but not if it means compromising the standard and quality of training. It is important to maintain a high level of interaction between tutors and students. If the NCK increases the size of e-learning classes, tutors may become overworked.

The NCK cannot just double the tutor to student ratio. We have made an exception for the AMREF Virtual Nursing School, permitting it to test a ratio of 50:1. We are not ready to extend this right to other schools until we see firm evidence that the quality of training will not suffer. As yet, we have not seen any such evidence.

AMREF is trying to encourage nursing schools to develop formal partnerships with all approved teaching facilities in their district, whether government, private or faith-based. Most nursing schools participating in the programme have not developed formal partnerships with other teaching hospitals. Nurses enrolled on the programme at a government nursing school cannot book a clinical placement at a nearby private teaching hospital, for example. More partnership of this kind will help to relieve congestion in clinical centres.

Enrolment patterns for e-learning and distance learning

Source: AMREF
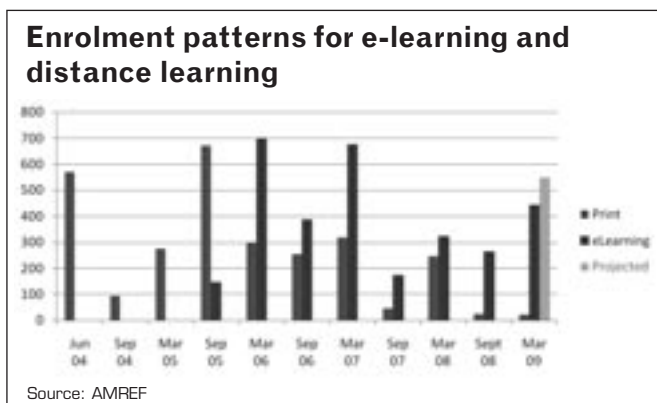
17. The mobile support network

Cellular phones have become an important component of the e-learning infrastructure. AVNS has developed a way of contacting all our student nurses via their mobile phones – we call it the mobile support network. All students' mobile phone numbers are logged in a database. Students are required to have at least two telephone tutorials for each module.

Our software, Frontline SMS from Kiwanja.net, enables AVNS tutors to send out group text messages to all students. Tutors can remind students about an upcoming exam, or about how to access a relevant medical document. Nurses are able to send questions to their tutors via text message, which are stored within the computer programme. Tutors reply to individual questions based on their specific areas of expertise.

AVNS students live all over the country, not just in Nairobi. Tutors need to be able to contact all their students quickly and efficiently. The mobile support network is a more reliable source of communication than email because internet connectivity is poor in much of the country. Most nurses don't check their e-mail regularly as they have to go to a cyber cafe to access the internet.

18. The student to tutor ratio

The potential of e-learning to repair the skills deficit among nurses in Kenya depends on achieving real economies of scale in teaching. It is essential to increase the intake of student nurses to accelerate the pace of training. According to the Nursing Council of Kenya (NCK) guidelines, one tutor should not teach a class of more than 20 students. The NCK must ensure that nurses are properly trained, and not 'fast-tracked' though the registered nursing diploma without adequate preparation. The same ratio is applied to the national e-learning programme, where nurses are not taught in classrooms.

At AVNS, we have secured a significant concession. The NCK has given AVNS permission to test a new student to tutor ratio of 50:1. Traditionally, tutors spend most of their time teaching student nurses in classrooms. At AVNS, as in other schools which offer e-learning, there are no classroom lessons. The majority of learning is done in computer labs. We argue that distance learning programmes enable the student to tutor ratio to be increased.

Students from the first AVNS class sat final exams for the registered nursing diploma in January 2009. Encouragingly, the pass rate among students who completed the course was 93%. But not all students from the class made it to the national exam: ten students were not eligible to sit the final exam because they failed AVNS tests. They will be allowed to proceed to the final

exam after re-sitting and succeeding in the internal tests. A further 13 students dropped out or deferred – the flexibility of the programme allows them to postpone assessments. Of the 27 nurses who took the national exam, 25 qualified.

The NCK have accepted these results, but are yet to change their official position on the statutory national minimum student to tutor ratio. In my view, increasing the student to tutor ratio is essential, if we are to increase the number of nurses in training at any one time.

19. Output and achievements

Approximately 2,000 nurses graduated with a registered nursing diploma between 2004 and 2008. This total is the cumulative figure for e-learning, print-based distance learning, and classroom students combined. A further 600 nurses are expected to graduate in 2009. A further 5,798 are in training to become registered nurses.

To date, no national survey has been conducted to assess the impact of e-learning on nursing in Kenya, although AVNS is preparing to carry out research on e-learning and nursing standards. AMREF relies on feedback from head nurses and hospital managers to assess the e-learning programme.

Despite initial scepticism among senior hospital staff members, their feedback has been largely positive. Some expected e-learning to add to the burden of staff shortages, but over time they have began to notice improvements in nursing care, notably:

• Increased confidence displayed by e-learning nurses
• Improved ability to manage and treat patients without consulting senior nurses or doctors
• Awareness of new and re-emerging medical conditions
• Improved administrative and managerial skills

Health facilities are beginning to pay for their staff to participate in the e-learning programme. In my view, this trend is the most reliable indicator that e-learning is improving the quality of healthcare in Kenya.

In July 2008, AMREF signed a memorandum of understanding (MOU) with Kenyatta National Hospital, the largest hospital in East Africa. Kenyatta hospital committed to fund 500 of its enrolled nurses over the next five years to join the e-learning programme at AVNS. In the first year, 100 nurses from Kenyatta hospital enrolled on the programme.

Key numbers

• **32** nursing schools participate in the e-learning programme

• **48** weeks of clinical experience needed to complete the registered nursing diploma, increased by NCK in March 2009 from 45 weeks

• **60** per cent of enrolled nurses work in rural areas

• **105** computer labs in health institutions across Kenya

• **230** registered nurses trained as e-learning tutors

• **500** computers running the e-learning programme

• **590** nurses graduated from the e-learning programme since 2005

• **1,098** enrolled nurses qualified as registered nurses in January 2009, after completing classroom, distance learning and e-learning programmes

• **2,243** nurses enrolled on the print distance learning programme at time of printing

• **2,739** nurses enrolled on the e-learning programme at time of printing

• **4,000** registered nurses working in Kenya in 2005

• **22,000:** the target number of enrolled nurses to be trained

A nurse's story

By Anne Kamene
Registered Community Health Nurse
Kangundo Hospital, Eastern Province

I have been working as an enrolled nurse at Kangundo Hospital in Kenya's Eastern Province for the past 15 years. In January 2009, I became a registered nurse, after graduating from AMREF Virtual Nursing School (AVNS) in Nairobi.

I was born in Tiva, a rural part of Kitui district, Eastern Province, in 1972. I am a single mother with two children: a 22 year-old daughter and an 11 year-old son. My daughter was born in 1986, when I was 14 years old. She is currently in her third year of a degree in information technology at Jomo Kenyatta University in Nairobi. My son lives with me, and is in his final year of primary school.

In 1992, I joined Muranga Medical Training Centre in Central Province to study for an Enrolled Community Health Nursing Certificate. The course took two and a half years to complete, at a cost of 30,000 Kenyan shillings. I had the option to continue studying for a registered nursing diploma, but by then my daughter was eight years old. I could not afford to pay tuition fees and remain unemployed for two more years.

My dream has always been to become a registered nurse. I admired my colleagues who are registered nurses for the way they care for hospital patients. They have such detailed knowledge of everyday medical conditions. I became increasingly frustrated. In my hospital, enrolled nurses are given the most basic responsibilities, such as dressing wounds, handing out medication and bathing patients. I wanted to offer my patients a higher standard of care.

e-Learning was a new concept to me. I enrolled on the e-learning programme in March 2007, as part of the first class of students at AVNS. The best aspect of the programme was its flexibility, allowing me to remain in full-time employment. I did not have to leave my job or family.

Before I joined the programme, I had never even used a computer before. To my surprise, I did not find it hard to adapt to e-learning. At AMREF, we spent two weeks being coached in IT skills. I would not say that I am computer literate, but I can use a computer well enough to run the programme.

The e-learning programme taught me many new skills. I am more confident now, as I can diagnose and treat a wide range of medical conditions, from mental illness to infectious diseases. Previously, I would rely on advice from senior nurses and doctors. Today, I can treat more patients independently.

I am even able to notice mistakes made by doctors. Last year, a young boy with malaria and hepatitis B - conditions that put heavy strain on the liver - was prescribed paracetemol by a doctor. I questioned this on the basis that paracetemol would cause the liver to overwork. I suggested he should be given declofenac, a drug that does not react with the liver. The doctor agreed and changed the prescription. I would never have been able to do this when I was an enrolled nurse.

Studying for a registered nursing diploma while in full-time employment was hard. On an average day I would leave my job at 4pm, work in the computer lab until 7pm, then return home to tend to my son. I would wake up in the middle of the night to study for two hours from worksheets I printed at the computer lab. At 6am, I would prepare my son for school before leaving the house for work at 7.15am.

The e-learning programme was a financial strain too. I had to rely on a Ksh600,000 (US$7,800) loan from Equity Bank. My tuition fees over the two years were Ksh117,000 (US$1,500), but I have also had to pay Ksh80,556 (US$1,045) per semester for my daughter's university fees and Ksh5,400 (US$70) per term for my son's school fees. I had managed to save Ksh50,000 (US$650) over the years, but I lost it all in a pyramid scheme.

There was a time when I thought about giving-up completely. My son had been doing very well at school before I joined the programme, partly because I had time in the evenings to help him with his studies. As soon as I joined AVNS, his grades began to drop, because I no longer had the time to coach him through his homework. When I discovered my son was performing badly in school I felt so depressed. But I decided to carry on, as I knew my nursing diploma would benefit us both in the long-run.

Today, I am a proud to say that I am a qualified registered nurse. My next dream is to one day continue my nursing education to degree level, once I have paid off all of my debts. Unfortunately, I cannot see this happening while I live in Kenya.

At the end of each month, once I make my loan repayments and taxes have been deducted from my salary, I am left with Ksh3,000 (US$40) to pay for food and bills. If I had an opportunity to work abroad, I would grab it with both hands. I know I would be able to earn a higher wage in the UK or US.

20. Funding and governance

e-Learning

Accenture and the Accenture Foundations funded a large proportion of the e-learning programme, contributing US$2.9 million over a five-year period. A cash donation of US$1.7 million has been provided by the Accenture Foundations. Funding is due to expire in 2010. Negotiations are underway, with a view to securing a further contribution of US$290,000 to support the ongoing development and roll-out of the e-learning programme.

The balance of US$1.2 million is calculated on the basis of *pro bono* services, including 14,500 hours of IT support from Accenture Learning Services. The staff time donated by Accenture Learning Services was dedicated primarily to designing software and training AMREF staff in computer programming. No other donors have contributed to the national programme.

Tuition fees generate the balance of funding. Nurses are required to pay about US$1,500 in course fees over the two years. Fees are paid directly to nursing schools, to cover the costs of administering clinical assessments. No other state subsidies or funding are directed to support the programme.

AVNS

AVNS is funded separately from the wider e-learning programme. AVNS was set-up in 2007 – mid-way through the programme – in response to a need for practical solutions to challenges faced by nursing schools which had adopted the methodology developed by AMREF. No money was earmarked for AVNS in the funding from Accenture. AVNS has secured funding from other donors, principally:

- Flying Doctors Society of Africa, an AMREF programme which offers emergency evacuation services to critically ill patients in remote areas, provides US$20,000 a year in unrestricted funds.

- The Fresenius Foundation, the charitable trust of a global healthcare company, has funded staff salaries and a specialist skills lab at AVNS. The skills lab is equipped with anatomical dummies and medical apparatus commonly found in most hospitals in Kenya. Nurses are able to practise essential clinical skills before formal assessments.

- PSO is an association of Dutch civil society organisations which funds innovation and capacity building in the developing world. They have funded initiatives including production of DVDs of clinical demonstrations; procurement of laptops from Computer Aid, a UK charity; and monitoring and evaluation.

The steering committee

The e-learning programme has brought together private enterprises, faith-based institutions, international charities and the Kenyan government. Early on, AMREF recognised the potential for conflicting agendas. From inception, AMREF established a steering committee on which all the different stakeholders are represented, including the MOH, NCK, Accenture and nursing schools.

The steering committee is mandated to:

- Approve management decisions relating to the administration of the e-learning programme: e.g. location of computer labs, distribution of personnel.
- Develop strategies to increase total participation by nurses on the programme.
- Develop ways to improve the e-learning methodology.

The steering committee has no power or jurisdiction over the teaching curriculum. It can only make suggestions to the relevant authorities to update or amend the national syllabus. All decisions relating to the nursing curriculum are the responsibility of the NCK and MOH.

A report from the wards

By Philomena Maina
Chief Nurse
Kenyatta National Hospital

Kenyatta National Hospital (KNH), formerly King George VI, was established in 1901. It was the first hospital built in Kenya specifically for the native population. With 1,800 beds, KNH is Kenya's largest health facility, and second largest in Africa. We offer a full range of specialised medical care, from burns treatment to open-heart surgery. Doctors at KNH rely heavily on nurses in the provision of medical treatment.

The standards of care provided by hospitals are changing due to innovations in medical practice. Treatment is increasingly specialised and sophisticated. The expectations of patients are also higher. Medical professionals need to be able to respond to these changes.

KNH employs 800 enrolled nurses. In 2008, we signed a memorandum of understanding with AMREF Virtual Nursing School. Over five years, KNH has agreed to pay for 500 of our enrolled nurses to train for a registered nursing diploma through e-learning. The programme is convenient for KNH. Nurses are not required to take extended periods of leave, minimising the strain caused by shortages of staff. Because nurses remain in full time employment, we are able to monitor and evaluate their progress.

e-Learning promises an efficient way to bring large numbers of experienced nurses up to speed with modern day nursing practice over a relatively short period of time. Classroom education is still relevant, particularly for students who have never practised nursing before. They need regular face-to-face interaction with tutors.

Experienced nurses are building on what they already know. They are familiar with the fundamentals of nursing care. With e-learning, nurses will learn about a new aspect of clinical care in the computer lab. The next day, they can put their new knowledge into practice. e-Learning enables nurses to grasp new skills efficiently.

KNH have not conducted a formal survey to evaluate the impact of e-learning on clinical care. Personally, I have noticed the following improvements:

• Confidence in clinical areas
• Ability to clearly articulate medical symptoms
• Diagnosis of medical conditions
• Management of time
• Interaction with senior nurses
• Research into unfamiliar medical conditions

21. The brain drain

Africa has a history of skilled health workers emigrating to developed countries in search of better paid jobs. National health systems catering for aging populations in Europe and America have created a high demand for skilled health workers, offering higher pay and better working conditions.

In 2009, AVNS conducted a survey of 27 graduates from the e-learning programme. Respondents were asked whether it was their long-term aim to continue working as nurses in Kenya. Of 27 interviewees, 20 nurses expressed a desire to migrate to either Europe or America. Low wages were cited as their main motivation for wanting to leave. Most of these nurses worked for government health institutions.

Enrolled nurses in Kenya are paid between US$100 and US$250 per month, depending on location and employer. They are not guaranteed a pay rise when they receive their registered nursing diploma, particularly in government institutions. No new funds have been made available by the MOH to increase salaries of nurses who complete the registered nursing diploma.

The probable impact on migration of an increase in the aggregate number of registered nurses is difficult to predict. However, anecdotal evidence from nurses implies that e-learning may reduce the likelihood of qualified nurses seeking new employment abroad. By enabling nurses to continue to work and study without leaving local communities, distance learning in any form is less disruptive to family and other social networks than traditional tuition in classrooms. If it can be demonstrated that e-learning encourages 'stickiness' - that is, the propensity of nurses to continue to work in their local communities - then improvements in local capacity are more likely to be sustained.

22. Recommendations

The brain drain is a real and urgent concern for Kenya's health sector, and in every African country. According to most forecasts, Kenya will fail to achieve the targets for public health in the Millennium Development Goals by 2015. The combined impact of population growth, urbanisation and poor sanitation has contributed to a rising incidence of infectious diseases.

In reality, it is not feasible to stop skilled professionals from seeking better paid jobs abroad. Nor, even if it were desirable, would it be morally defensible to impede the movements or ambitions of Kenyans who seek to participate in the global economy.

Equally, Kenya cannot afford to lose large number of health professionals. The costs of training nurses, in both time and national resources, are high. A qualified registered nurse is likely to have completed at least three and a half years of professional training. For as long as skilled migrants choose to leave Africa, governments must give priority to training health workers.

Improving capacity to train nurses and other professional staff is the only viable policy response to the skills deficit. By offering opportunities for enhanced training and qualifications to nurses in work, the prospects of skilled nurses emigrating may even be reduced. Nurses who are not required to re-locate to established teaching centres, leaving their homes and families, may be less keen to migrate after graduation. Improved skills are likely to bring more responsibilities and job satisfaction for nurses, without a change of employer or country of residence.

Nursing schools are the primary facility for professional education, in partnership with teaching hospitals and other clinical facilities. In Kenya, the capacity of these institutions to absorb high numbers of additional students seeking clinical placements is limited. At AVNS, new partnerships between the nursing school and teaching hospitals have sought to address these constraints. Partnerships have been one of the key achievements of AVNS, and provide an example to other medical schools. After long delays and problems of congestion at clinical sites during the initial phase of the e-learning programme, student nurses at AVNS are able to schedule clinical placements at teaching hospitals without significant problems. All medical schools should give priority to developing:

- Formal partnerships with teaching hospitals whether in the state, private, or faith-based sectors.
- Mechanisms to improve and facilitate access to clinical placements for student nurses.

External support has been invaluable in the development of AMREF's e-learning programme. Its achievements to date would not have been possible without contributions, both financial and technical, from Accenture, the global consulting and technology services group. Designing systems which are consistent with the accounting and other practices of potential donors can substantially improve the prospects of securing help.

In e-learning, technical advice and 'in-kind' assistance can have a greater lasting impact on the capacity of local health institutions than financial grants. This must be given priority in planning new programmes. In our experience, it can be easier to obtain cash from donors than to secure technical support or *pro bono* professional assistance.

Accenture's experience software design was indispensable to the development of a 'scale-able' e-learning programme which could be rolled out across the country. The experience of 'scaling up' the AMREF programme in Kenya argues for:

- Sound technical support in the early stages of software development.
- Giving precedence to 'in-kind' technical assistance in the design period, and for the duration of the pilot phase.

• Channelling financial sponsorship or donations to support the roll-out and 'scaling up' of e-learning systems.

The mobile support network incorporated within the AMREF e-learning software makes use of cellular phones to compensate for poor or interrupted internet connectivity. Tutors are able to contact students directly, either individually or as a group, via cellular phones. A mobile support network is an highly practical innovation for any distance learning programme, whether e-learning or based on more traditional textbooks. Medical schools and other training centres should adopt similar platforms to take advantage of the popularity of mobile phones in Africa.

The student to tutor ratio is a key determinant of the gains in reach and scale made possible by e-learning. In Kenya, the goal of re-training 22,000 nurses within nine years will not be achieved without significant economies of scale by comparison with classroom teaching. The Nursing Council of Kenya requires a maximum student to tutor ratio of 20:1 for classroom teaching and for any form of distance learning, with the exception of the programme administered by AVNS.

AVNS has been granted a special dispensation to run e-learning programmes with a student to tutor ratio of 50:1. Although this dispensation recognises AMREF's contribution to increasing the aggregate total of nurses in training for the registered nursing diploma, other institutions which participate in e-learning programmes need to demonstrate their capacity to train nurses effectively at the higher student to tutor ratio.

Reparations for the loss of skilled health professionals from Africa to industrialised nations are a vexed and politically sensitive issue. However, effective e-learning systems represent a viable, concrete method by which wealthy countries might contribute to building new clinical capacity in Africa.

The United States, United Kingdom and South Africa are the principal destinations for Kenyan nurses working abroad. The governments of these countries should consider compensating Kenya by contributing to initiatives to build the capacity of medical schools and teaching hospitals in Kenya.

Options for reparations of this kind include:

• Financial support for health institutions
• Subsidies for student nurses
• Provision for clinical training and experience, in Kenya or abroad
• Supply of training equipment
• Secondment of skilled personnel

Policy makers should encourage international debate to develop a formula for reparations, whether financial or other forms of 'in kind' assistance, in proportion to the numbers of African health professionals employed abroad in the health systems of their host countries.

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NURSING THE FUTURE
e-Learning and clinical care, in Kenya

By Angela Nguku

Much has been said about the promise of information technology to transform Africa. Already, cellular phones and internet cafes connect rural villages to distant cities and international markets. This new electronic infrastructure promises to extend education and training far beyond the geographical constraints of an old-fashioned classroom. In this new world, old ways of learning can be harnessed to the emerging powers of technology: a process of evolution, as much as revolution.

Few tests of the new methods of e-learning can be more exacting than to improve standards of clinical care by hard-pressed nurses in Kenya's busy hospitals and clinics. But such is the ambition which drives the country's first nationwide e-learning programme for nurses, devised by the African Medical and Research Foundation (AMREF). Its ultimate goal is to upgrade the skills of 22,000 working nurses to equal the demands of managing epidemics such as HIV/AIDS, often in an environment of rapid urbanisation and poverty.

In this candid and detailed account, Angela Nguku chronicles the evolution of e-learning among nurses in Kenya. From her perspective as coordinator of the AMREF Virtual Nursing School in Nairobi, she charts both the obstacles – a shortage of qualified tutors, the scarcity of clinical placements – and the priorities to overcome them. Kenya is widely expected to fail to meet the United Nations' Millennium Development Goals for health by 2015, but the lessons of e-learning indicate an alternative and important path to improving standards of care.

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