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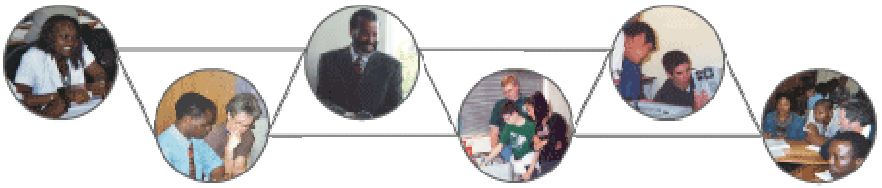

We Help People, Communities and Institutions Apply Information Technologies

NetTel@Africa

A 3rd year internal assessment (Oct 2005)

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A 3rd Year internal assessment

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Executive Summary

This document outlines the third-year internal assessment of the NetTel@Africa, established as a Global Development Alliance. NetTel is a multi-country network for capacity building and knowledge exchange in telecom policy and regulation in Africa, via hybrid techniques of face to face training and eLearning, peer relationships, local research, and ICT applications. The document traces the evolution of NetTel, its governing structure, and early capacity building results.

The internal assessment is based on appreciative inquiry and participatory reflection, drawing on quantitative and qualitative surveys, facilitated group discussions, and thematic evaluations. The internal assessment draws out critical success factors, such as, trust among the communities of practice--educators, regulators, and industry players and an inter-related set of capacity building activities among diverse stakeholders.

Initial USAID funding was provided through an Internews Network, Inc. Leader with Associates Cooperative Agreement (GDG-A-00-01-00009-00) with subsequent funding provided by DFID and SIDA. With multiple funding sources and multiple players, NetTel required multiple coordinators: TRASA to kick-start the process, Washington State University to provide USAID/Internews financial oversight, the University of Dar es Salaam as academic coordinator, and Makerere University as expansion (and peering) coordinator to overall coordinator (as of July 2005).

Expected results, as well as status of results, as articulated in the program description between Internews and WSU Center to Bridge the Digital Divide, are highlighted below. How the results were achieved is discussed in the body of the internal assessment report.

1) Strengthened institutional capacity of regulatory and policy bodies

a) 12 regulatory bodies in the SADC region with increased regulatory capacity and activities. Regulatory bodies not only in the SADC region but in West and East Africa have increased capacity and activities. Examples include the collaborative work on the NetTel Universal Access Cookbook; the discussions on wireless guidelines and emerging technologies, such as Voice Over IP; and, the research work done on telecentres and e-usage.

b) One African Association (TRASA) with the capacity to work with US counterparts. Undoubtedly, TRASA has enhanced its capacity to work as partners with US counterparts. In addition, the Association of Regulators of Information and Communication in East Africa (ARICEA), the East African Regulators of Posts and Telecommunications Organization (EARPTO), and the West African Telecommunications Regulators Association (WATRA) have joined NetTel and are able to articulate the terms of engagement with each other and with regulators from outside Africa.

c) One U.S. Association (National Association of Regulatory Utility Commissioners (NARUC) with capacity to work with African counterparts. NARUC played a limited role in part due to a difference in the definition of partnerships and the appropriateness of taking a model that worked elsewhere. NARUC did invite the TRASA executive committee to attend the NARUC annual meetings in Oregon. TRASA did invite NARUC to attend the Botswana pilot test of elearning materials. More valuable was the relationships between the state level public utilities commission (PUCs) and the African regulatory bodies at the national level and at the association level. For example, the Nigerian Communications Commission (NCC) sent Funlola Akiode to visit with the Washington, DC PUC and the Oregon PUC. As a result, she invited the Oregon PUC administrative judge to share his telecommunications expertise with the newly appointed Nigerian judges and lawyers and the accountant to review the NCC's regulatory accounting procedures.

2) Strengthened institutional capacity of academic and training institutions

a) Seven African academic institutions with enhanced capacity to offer certificate and degree programs in interdisciplinary telecommunications policy and regulation. Not just seven but

twenty African institutions have been engaged with capacity building efforts and signed the Memorandum of Agreement to co-teach courses together and recognize each other as co-lecturers. University of Fort Hare, University of South Africa, University of Western Cape and University of Wistswatersrand in South Africa; University of Bostwana; University of Dar es Salaam in Tanzania; University of Zambia; AFRALTI and Jomo Kenyatta University; and Makerere University were the first universities to develop course material for eLearning delivery. The University of Western Cape and University of Witswatersrand in South Africa, University of Dar es Salaam in Tanzania, University of Zambia, and Makerere University were the first to register students for the post-graduate diploma and masters degree programs. The University of Lagos and National University of Rwanda accepted students in July 2005. The rest plan to accept their first intake in January 2006.

b) Five US academic institutions with capacity to work with African counterparts through increased contact among faculty, students, joint teaching, projects, research and publications. The University of Colorado, Florida, Maryland and Washington State University have supported the development of courses and acted as mentors and online guest lecturers. Due to a change in leadership Michigan State University did not participate.

3) One functioning network that will provide:

a) A mechanism for building capacity (training and professional development) and exchanging information and knowledge on telecommunications among African and American regulators, academics and researchers. NetTel is the mechanism which provides capacity building on four components: training, peering, research and ICT applications (see Figure 1).

> The **ICT Applications** demonstrate the relationship between telecommunications policy and regulation and key sectors critical to the economic development process, particularly education. The notion is to demonstrate the synergies between ICT/telecommunications policy and other sectors and the implications of ICT/telecommunications policy and regulation on universal access particularly in rural areas.
>
> - Knowledge Exchange and Learning Partnerships (KELP) -- to stimulate active sharing of information, skills, and experience. Five South African universities developed innovative applications of ICTs to improve the quality of their teaching and learning.
> - Kenya Education Network (KENET) -- a collaborative of 40-plus colleges, universities, and schools in Kenya to improve the quality of teaching and learning through ICTs. The pedagogical approaches implemented by NetTel have been applied in KENET through several training programs. Several KENET institutions have joined NetTel. Go to http://www.kenet.org/.
> - Business for Information technology (BIT) -- BIT provides learning experiences for students to develop computer technology and business skills. BIT is an Applied Technology curriculum that empowers students with highly marketable skills and facilitates on-the-job training.

b) A peer to peer email based network to link African and American regulators. A listserv was developed but was not fully utilized. Instead when the African regulatory bodies require peer support an email is sent to the NetTel Overall Coordinator. In addition, a more formal mechanism for requesting peering has been instituted as indicated in (c) below.

c) Exchange programs and field attachments (study tours, technical assistance) between African and U.S. regulators. With a peering coordinator based at Makerere University and seconded from the Uganda Communications Commission (UCC) there is now a formal peering mechanism. For example, Rwanda regulators visited with the Nigerian Communications Commission for a couple of weeks. A UCC staff worked with Ethiopian regulators on service cap pricing.

d) Web-based teaching and training materials on telecommunications policy and regulation that will be accessible at each regulatory body and university. Ten courses at the post-graduate diploma level and ten courses at the masters level are now available at http://kng.nettelafrica.org.

e) A web-based platform for sharing experiences and materials on case studies (content development). Under the leadership of the University of Western Cape an online learning management system has been developed. The first version is called Knowledge-Based Environment for Web-based Learning (KEWL). Based on feedback from NetTel partners KEWL has been revised to KEWLNextGen. Examples of new features include: Active dynamic mirroring of server functions aimed at minimizing the effects of Africa's low bandwidth environment and Language selector that currently supports common African languages such as Xhosa, Zulu, Venda, Kiswahili, and Arabic. The current instructional ICT platform was found to be effective to upload, edit and update course material, though improving online interaction, low-bandwidth scenario activities, and detecting academic fraud were flagged as issues to tackle. Examples of the new features include:

f) A mechanism for joint research on key telecommunications policy and regulation. An AfricaDotEdu book has been published which discusses the state of Internet use by higher education institutions in Africa. An ICT Policy and Regulation Symposium has been initiated. Students who are going for their masters will be doing research on ICTs and telecommunications. Regulators have initiated discussions on the need for key performance indicators for telecommunications competition.

g) A framework for common standards for competence evaluation and certification of personnel. This has not yet been achieved but will be tabled for discussion during the next NetTel Executive Council meeting in February 2006.

h) A framework for regional certification agreements to support reciprocal recognition of qualifications. NetTel has devised a MOU that supports reciprocal recognition of qualifications among lecturers from 20 African universities.

These results have contributed to an increase in the number of stakeholders able to influence ICT/telecommunications policy or implement telecommunications reforms needed to improve investments in the sector and performance of the sector.

- About 1000 trained in workshops and peering activities
- About 75 lecturers and backup lecturers
- About 150 students enrolled in diploma and degree programs

The ultimate impact of interest related to capacity building outputs and outcomes are changes in ICTs/telecommunications policy, improvements in investments in the sector, and improvements in the performance of the sector. Despite only three years of existence, NetTel has contributed to the formulation of ICT/telecommunications policy.

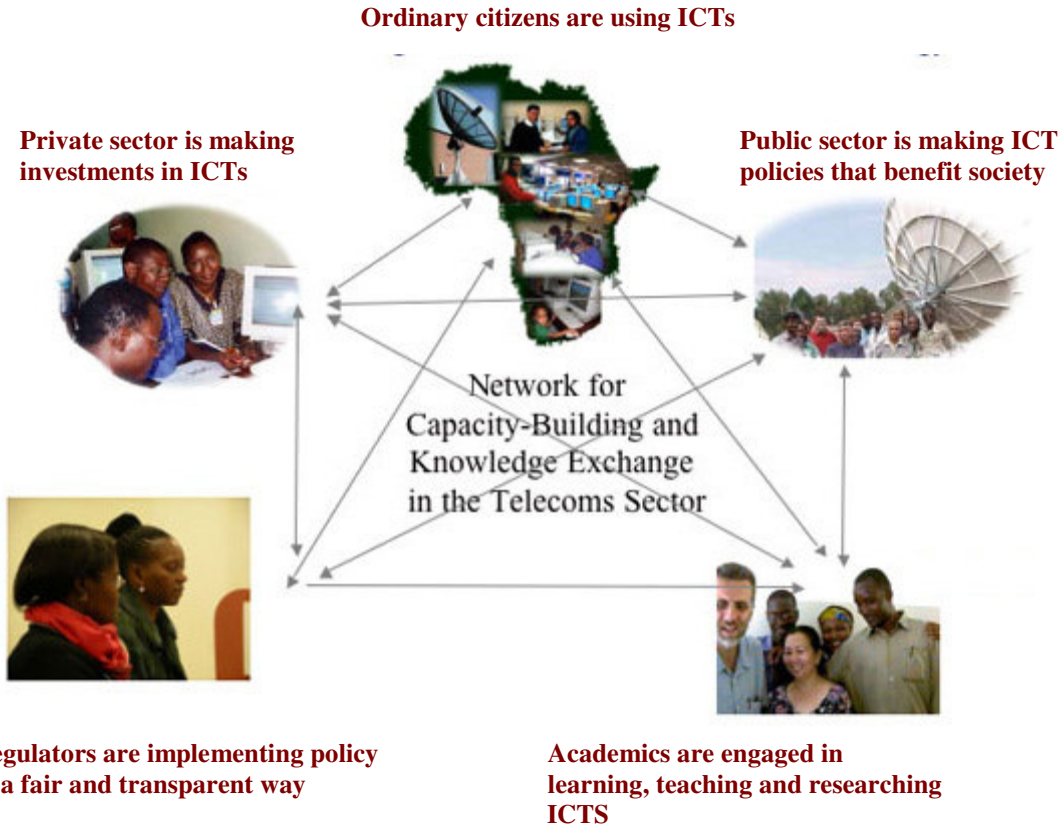
eEducation (South Africa) – The White Paper on eEducation sets out the South African Government's response to a new information and communications technology environment in education. The White Paper became legislation in 2004 and includes language on the eRate. The policy explicitly talks about the eRate. In terms of section 45(3) of the Telecommunications Act, 18 January 2005 shall be the date from when public schools and public further education and training institutions will be entitled to a 50% discount on: (a) all telecommunications calls to an internet service provider and (b) any connection or similar fees or charges levied by an internet service provider for accessing the Internet or transmitting and receiving signals via the Internet or for such access and transmission and reception.

Voice Over IP (Rwanda) - The key issue for regulation is that IP technology and packet transmission of VoIP traffic presents a fundamentally different set of opportunities and challenges than traditional circuit technology. The confluence of IP technology and its complexity, and the financial incentives to use it reflect concomitant regulatory challenges.

Wireless guidelines (TRASA) – The goal of TRASA Guidelines on Wireless Technologies and Regulation is to provide a platform for all 13 southern Africa nations (or as many as are willing to do so) to implement the same or very nearly the same regulatory environment. The reasoning is that the current regulatory environment is keeping costs up and expansion/innovation down.

Without making any direct attributions, the question remains on whether there are improvements in investments in the sector and improvements in the performance of the sector overtime. NetTel is better positioned to report on these improvements because of the request made by some of the regulatory bodies to review and reach consensus on the use of the following indicators: World Bank Benchmarking Regulators, ITU indicators, SCAN ICT indicators, and OECD Indicators of Telecommunications Competitions. Once the review is done, work will proceed on data collection and analysis on telecommunications competition in pilot countries.

Figure 1. Network for capacity building and knowledge exchange (NetTel)



NetTel@Africa

A participatory and appreciative internal assessment of a multi-country network for capacity building and knowledge exchange in ICT policy and regulation in Africa

Introduction

NetTel is the network for capacity building and knowledge exchange in ICT (incorporating telecommunications and information technology) policy, regulation and applications. The overall goal of NetTel is to make the provision of ICT services more accessible and more affordable. Achieving this goal requires improved policy and regulation as well as increased private sector investment. Thus, NetTel aims to build the capacities of policy makers, regulators, consumer advocates, and academic institutions.

Building capacity necessitated harmonizing four overlapping components:

- The Africa-based **Training Program in ICT Policy and Regulation** includes: development of ten courses at the basic level for the post-graduate diploma and ten courses at the advanced level for the master's degree at African universities; and development of an Executive Development Program for regulators and private sector participants.

- The **Peer-to-Peer (P2P)** exchanges focusing on three types of relationships among and between Africans and their non-African peers: academic-to-academic (closely tied to the training program above); regulator-to-academic (linked to the training program); and regulator-to-regulator (fostering reciprocity agreements for training and knowledge sharing among regulatory bodies within Africa, complemented by similar sharing between African and non-African regulatory bodies)

- The **Research Program** provides an opportunity for students to research the ICT sector that can then add to the knowledge base of the courses that compose the long-term Training Program. The research also serves as a platform for benchmarking the experience of African regulators and for tracking the performance of the sector.

- The **ICT Applications** demonstrate the relationship between ICT/telecommunications policy and regulations with key sectors critical to the economic development process, particularly education. The notion is to highlight for policy makers and regulators concrete ICT applications for development that can benefit from good policy and regulation within the context of a competitive telecommunications market.

Historical truism means that the first part of this discussion necessarily dwells largely on the interaction of regulators and policy makers in Africa with USAID, and the role of USAID and American institutions in helping to bring to reality the dreams and aspirations of their African counter-parts. The later part of the report brings on board the subsequent entry of other development partners, including DFID, Sida, and ePolnet, as well as academic and regulatory partners from other parts of the world.

Internal assessment objective, questions, and methodology

Policy and regulatory imperatives

Africa in the mid-1990's was failing to advance into the Internet age. The digital divide is most evident at the phase of connectivity: new ICT like mobile networks and wireless Internet can help stem this gap. But the regulatory climate in many emerging economies has only recently welcomed private sector ISPs, and WiFi/WiMax present an altogether new level of complexity to tackle (eg. peering agreements, voice traffic, spectrum allocation, coverage area).

Traditional telecom and new data services should be strongly promoted among sectors which would have the most propensity to harness it, but marginalized communities of Africa should not be excluded either.

Progressive policy-making capacity needs to be built up among bureaucrats, legislators, politicians, industry leaders, academics and civil society organizations: this constitutes the core mission of NetTel. Key cultural roadblocks faced in many developing countries include getting governments to stop treating their telecom monopolies like cash cows, and instead getting government telecom players to invest in areas like R&D on telecom products and services, so that the technology is seen as a market opportunity on a national and regional scale and not a disruptive threat on a local scale.

National regulatory authorities were ill equipped to judge the merits of emerging technologies, economic models and legal structures that would have supported the wide-spread adoption of promising new technologies. These authorities asked for assistance, which had traditionally been provided through ad hoc training workshops, usually in the first world countries. The NetTel program, through a new capacity building paradigm, offered the opportunity to link academic, legal and other technical experts to national regulators through university and related programs in each country, creating an environment of perpetual learning within each country, and among the African countries.

Internal assessment has accompanied each event during three years of formal implementation of NetTel. Nevertheless, along with a fourth year time extension, a decision was made to do a formal internal assessment of what NetTel has accomplished from June 2002 through July 2005.

Objective of the internal assessment

The primary objective of the internal assessment is to assess progress toward planned results of NetTel.

Questions

In view of the expected results and outcomes outlined in the project documentation, the key internal assessment questions are:

1. Does NetTel represent the vision of a Global Development Alliance? What are the key success factors?
2. As an alliance, how did NetTel meet its capacity building objectives? What results were achieved at the output and outcome levels?
3. How are the outputs and outcomes contributing to the longer-term capacity-building results and impact: (a) changes in ICT/telecommunications policy; (b) improved investments in the sector; and (c) improved delivery of services to the public.

Methodology

In addition to document review, this internal assessment makes use of participatory evaluation principles, appreciative inquiry techniques, and quantitative questionnaires. See Attachment 1 for interview protocol and questionnaires.

Participatory evaluation

NetTel has multiple stakeholders who gain and contribute to NetTel. The decision to make use of participatory evaluation principles is driven by the desire of those with a stake in NetTel to enhance teamwork and to improve performance at various levels. Participatory evaluation:

1. Helps the capacity of stakeholders to reflect, analyze, and take action.
2. Contributes to the development of lessons learned that can lead to corrective action or improvements.
3. Helps to ensure that short-term results lead to long-term results and outcomes.

Appreciative Inquiry

Appreciative Inquiry (AI) is an organizational development philosophy and methodology that focuses on fostering growth and change by identifying, appreciating, and utilizing the "most central strengths and resources of an organization" or an individual (Gergen & Gergen, 2004, p. 57). According to Cooperrider and Whitney (2001, pp. 19-22), five main principles ground AI:

1. *Constructionist Principle:* Knowledge about an organization is interwoven with its destiny. Knowledge emerges from the relationship rather than the individual.
2. *Principle of Simultaneity:* Inquiry and change are not separate, but are simultaneous and interwoven processes.
3. *Poetic Principle:* All stakeholders study the organization from the nature of joy and moments of creativity, not from alienation and moments of debilitation.
4. *Anticipatory Principle:* The two most important resources for constructive institutional change are the collective imagination of those involved in the institution and the discourse about the organization's future. Positive images of the future lead to positive actions.
5. *Positive Principle:* Momentum for change on positive effect and social bonding.

Following these appreciative inquiry principles, a qualitative survey was devised, based on the 4-D model components (Cooperirder et al): discovery (appreciate "What is"), dream (imagine "What might be"), design (determine "What should be") and delivery (create "What will be"). Responses to the 10-question survey were audio-taped, transcribed and then analysed by the internal assessment analysis coordinator. The interviews were conducted with four evaluators at the Delft meeting in July 2005; most respondents signed consent forms agreeing to have their views recorded and used for analysis.

Online questionnaires

Several questionnaires have been developed and have been or will be implemented to evaluate certain aspects of NetTel. The questionnaires are directed at instructors and students in the NetTel program and various regulators throughout Africa. The July 2005 internal assessment consisted of responding online to a questionnaire with several question types: Likert-type, open ended, ranking, etc.

There are several levels of reliability checks built into the forms, including: reverse scored items, consistency checks (i.e., students reporting on instructor behavior and instructors reporting on their own behavior).

The instructor and student forms were designed to assess three related constructs: technology for course delivery, experience with students and the online classroom, and NetTel overall goals. The regulator questionnaire is designed to assess the overall impact of NetTel in the regulatory sector as observed by the regulators themselves. All forms assess capacity building in some sense.

All initial measurements will be considered a baseline – and future internal assessments will be compared to these results.

Context

TRASA's request

The impetus for the Network was a request for more coordinated training and capacity building by the Telecommunications Regulators Association of Southern Africa (TRASA). In discussions between USAID and TRASA, the request consisted of the need for multi and interdisciplinary disciplines, a range of levels to include basic to advanced knowledge, the possibility of getting some form of certification or diploma, and learning from fellow regulators through field attachments, secondments, and so on.

Interdisciplinary

Since most of the regulators at that time came from an engineering background, the request was for engineers to be able to understand the need for policy and regulation, for policy makers who did not have engineering backgrounds to understand the technical aspects of what they are making policy about and what they are regulating, and for both engineers and policy makers to understand the financial implications of their policy decisions and technology choices.

Basic to advance knowledge

TRASA also stressed that different donors offer workshops; however, all the workshops were similar in content and stayed at the basic level. A range of offerings would make more sense to cater to the requirements of varying human resources.

Certification

Another part of the request made by TRASA is the option to get certification and the ability to collect credits for a postgraduate diploma or master's degree program.

Field Attachments

TRASA also emphasized the need for field attachments and secondments among regulators in the region and among their peers outside Africa.

USAID's response

USAID listened and shared a discussion paper with the TRASA secretariat during the RAPID seminar in Swaziland on February 2001. The discussion paper suggested three options:

- Option 1—follow the best of the USTTI practices to offer a menu of training programs;
- Option 2 – build on option 1 and make it possible for participants to collect credits/units for a professional diploma or post-graduate degree (MSc) in telecoms; and
- Option 3: build on option 2 and build a network of excellence made up of African and non-African institutions to offer a diploma and post-graduate degree in telecoms. The last option will build not only the capacity of practicing regulators but also build capacity of African institutions to prepare "replacement" regulators and policy-makers.

Listen first and listen again

A series of stakeholders meetings facilitated by the USAID Regional Center for Southern Africa and the Leland Initiative shaped the idea further. Below is a timetable summarizing key events towards the formation of NetTel.

- April 2, 2001, a training coordination meeting attended by TRASA members in Johannesburg tasked the HRD committee of TRASA to develop the concept of a network for capacity building.

- May 7-9, 2001, several interested partners agreed to assist TRASA in developing and running courses through a network comprising of U.S. and Southern African universities and training institutions. The development partners who indicated interest include the Regional Center of Southern Africa (RCSA) and the Leland Initiative of USAID, the International Telecommunications Union (ITU), the Commonwealth Telecommunications Organization (CTO), and the United States Federal Communications Commission (FCC).

- July 22-26, 2001, a working group, made up of African and American stakeholders, met in Arusha and identified existing programs in the region and drafted an initial prospectus of collaborative training modules and courses.

- September, 2001, at the TRASA general meeting the decision was made to go forward with the implementation of the Network for Capacity Building and Knowledge Exchange in the Telecoms Sector in Africa, with an initial focus in the SADC region.

- April 8-11, 2002, this meeting included a formal launch of the NetTel program and resulted in the drafting and signing of the Declaration of Partnership. Documents from this meeting are available at http://www.nettelafrica.org.

- June 1, 2002, USAID funding for a three-year program was made available through the DOTGOV initiative being implemented by Internews.

Commit funds

USAID's Regional Center for Southern Africa (RCSA) and the Leland Initiative provided initial funding for NetTel as a Global Development Alliance (GDA), funded through a Leader with Associates Cooperative Agreement (GDG-A-00-01-00009-00) implemented by Internews Network, Inc. USAID tasked the Center to Bridge the Digital Divide (CBDD) of the Washington State University to serve as a catalyst to mobilize the ideas, efforts, and sources of the public sector, corporate America, the higher education community and non-governmental organizations in support of shared objectives related to bridging the digital divide in Africa. This is consistent with the mission of the CBDD and with the objectives of USAID's GDA initiative and Internews' DOTGOV effort.

The GDA approach combines cooperation and competition in sharing knowledge, learning, skills, and resources; in working together, as well as working in parallel, on different aspects of the capacity building problem. The approach combines long-term objectives with flexibility to respond to the training needs of the moment. The USAID-funded agreement is based on the following understandings:

1. The objectives of NetTel are:

    - To develop and strengthen capability to generate policy, regulatory, managerial and technical expertise to address the needs of the telecommunication sector in the SADC region and member countries.

    - To enhance the capacity of key decision-makers and human resources engaged in the implementation of telecommunications policy to keep abreast of new developments in technology and global and regional standards and procedures and to maintain similar and adequate standards of performance in the telecommunications sector.

2. The operation of the NetTel falls within the SADC Protocol for Transport, Communications and Meteorology and provides a general framework for ensuring linkages among global, regional, and national capacity building activities, including those facilitated through SADC and in the context of international agreements.

3. The activities of the Network will include but shall not be limited to the following:

- Harmonization of focal points for training, professional development, research and information on matters related to telecoms in the SADC region;

- Development of common curriculum frameworks, including Internet based courses, for the education and training of personnel; in accordance with the needs and priorities of the SADC members;

- Development of common standards for competence evaluation and certification of personnel;

- Development of a regional directory of training specialization and centers able to provide the appropriate training;

- Joint provision of training or sharing of Internet-based courses; and coordination of training programs for the countries of SADC with the regional centers;

- Conclusion of regional certification agreements to support reciprocal recognition of the qualifications.

4. The University of Dar Es Salaam (UDSM) was chosen by the participants in July 2001 at the meeting in Arusha to act as the Academic Coordinator. Coordination will be undertaken in collaboration with the co-conveners of the Human Resource Development Sub-Committee of the Telecommunications Regulators' Association of Southern Africa (TRASA). The co-conveners were the representatives of the South Africa (now ICASA) and the Tanzania (TCRA) regulatory bodies.
5. The Network will offer a diverse curriculum of cutting-edge communications training to maximize the learning experience for participants. Moreover, the Network will tap the private and public sector (including academic institutions) to provide diverse training for TRASA participants and to contribute valuable in-kind support to TRASA. Finally the Network will offer a menu of training modules and course offerings that are based on priorities set by participants or those who will benefit from training.
6. The network will address the capacity building needs of:

    - Policy makers, including parliamentarians and legislators who have the power to make policy decisions, regulators, and boards in the development of regional and national sector policies and regulations;
    - High level government telecom sector line ministries and corporate managers in the management of telecoms networks and services;
    - Frequency managers in the management of frequency spectrum in its policy, regulatory and technical aspects;
    - Technocrats and technical staff of regulatory bodies;
    - Private sector and public telecom operators;
    - Interested stake-holders (operators, ministries, consumers, courts) to sensitize all in terms of operations of regulators;
    - Students interested in pursuing careers in the telecommunications sector.

Leverage other donor funds and local resources

USAID met with several times with DFID and Sida about pooling funding resources. As a result, DFID and Sida provided funding in March 2004, with Makerere University as the lead implementing institution. ITU has also provided support for AFRALTI's participation in NetTel. DBSA's support was primarily to the University of Wistwatersrand and preceded the formal operations of NetTel. CTO provided permission to use the training materials they have developed. Subsequently Industry Canada

and ePolnet also provided support to cover peering, workshops, and training – especially for policy makers in the case of ePolnet – on an event by event basis.

Support in terms of access to knowledge resources were provided by UN APDIP and their ePrimers, MIT for material made available through their Open Courseware. Academics and regulators from Africa and the U.S. gave generously of their time.

Finally, and more importantly, the regulatory agencies, particularly in southern Africa co-funded most of the major events. Other national regulatory bodies, like the Nigeria Telecommunications Commission, took the lead in forming their own regional associations, sometimes using some of their own funds.

NetTel as a Global Development Alliance

> *I am because we are (Ubuntu)*

Alliance Precepts

From its inception, NetTel partners have subscribed to the following precepts:

1. *African-led* – the emphasis is on the leadership role of Africans, with a specific focus on the role of regulators and higher education institutions in ICTs for development.
2. *Mutual benefit* – the benefits from learning together are appreciated by both African and American faculty, students and regulators.
3. *Shared objectives* – the objectives that are shared include:
    a. Integration of ICT into learning and teaching in order to complement face to face learning with ICT mediated learning;
    b. Joint knowledge generation, codification, and transfer in order to engender multiple-level partnerships and collaborative relationships (universities, government, industry, NGOs); and
    c. Policy dialogue among academics and policy dialogue among regulators in order to discuss harmonization of standards.
4. *Reciprocal relationships* -- the relationship moves away from one-way technical assistance or knowledge transfer to two-way knowledge exchanges.

Alliance partners

> *When the webs of the spider join, they can trap a lion.*
>
> Ethiopian proverb

The network came about through a participatory process: The regulators and practitioners in the field identified the knowledge requirements for a good regulator; the academics from Botswana, Kenya, South Africa, Tanzania, and Zambia were invited to design an interdisciplinary curriculum on ICTs policy, regulation and applications; and U.S. academics and regulators played a supportive role as peers. And because neither the African nor the U.S. universities had a full curriculum on ICTs/telecoms policy and regulation, it became necessary to combine forces and work toward a common curriculum. Thus, knowledge production was a partnership among African and US universities and African and U.S. regulatory practitioners (later expanding to other universities and other regulators). The users were national regulatory authorities. The Center to Bridge the Digital Divide at Washington State University served as the boundary-spanning organization.

How NetTel evolves is dependent on how well the network partners remain focused on the objectives of the network, how they continue to engage each other and hold each other mutually accountable for results, and how resource partners behave as co-equal partners instead of dominating the network.

Table 1. List of NetTel Alliance Partners

Declaration of Partnership signatories in April 2002 included:

1. Regulatory Associations
   - Telecommunications Regulators' Association of Southern Africa (TRASA)
   - National Association of Regulators Utilities Commissioners (NARUC)
   - US Federal Communications Commission
2. African and American academic institutions
   - University of Botswana
   - University of Colorado
   - University of Dar es Salaam
   - University of Florida
   - University of Fort Hare
   - University of Maryland
   - University of South Africa (UNISA)
   - University of the Western Cape
   - University of Witswatersrand, Link Centre
   - University of Zambia
   - Washington State University
3. Training Institutions
   - African Advanced Level Telecommunications Institute (AFRALTI)
   - United States Telecommunications Training Institute, Washington DC
4. International NGOs
   - African Connection Secretariat
5. Resource partners
   - United States Agency for International Development (USAID)
   - Commonwealth Telecommunications Organization (CTO)
   - Development Bank of Southern Africa (DBSA)
   - International Telecommunications Union (ITU)

With funding from DFID and Sida in March 2004, the Network now includes associations and academic universities from East and West Africa:

6. Regulatory associations
   - ARICEA
   - EARPTO
   - WATRA
7. Academic institutions
   - Eduardo Mondlane University (Mozambique)
   - Makerere University
   - Makerere University Business School
   - National University of Rwanda
   - Obafemi Awolowo University at Ile-ife (Nigeria)
   - University of Cheik Anta Diop (Senegal)
   - University of Jos (Nigeria)
   - University of Lagos (Nigeria)
   - University of Nigeria at Nsukka
8. Other Partners
   - TU Delft, the Netherlands
   - Swinburne University of Technology, Australia
   - Center for Telecommunications Policy Studies, India
   - Strathclyde University, U.K.
   - UN Asia Pacific Development Information Project (APDIP)

Governance structure

The NetTel Governance outlined in the Declaration of Partnership, and was subsequently refined in the Memorandum of Understanding (MOU) among African universities. The MOU explains the roles and responsibilities of the Executive Council, initially constituted as the Advisory Council; the Academic Board; the NetTel Director; and the academic coordinator. As NetTel evolved, the need for an MOU among regulatory bodies became apparent and is being executed. In addition, a peering coordinator was added to the Governance structure. See Figure 2 for NetTel's governance structure.

Executive council

After several false starts the Executive Council was finally formalized in April 2005 and had its first meeting in July 2005. Papers tabled for discussion at the two meetings are available at http://www.NetTelafrica.org. At the July 2005 meeting the Executive Council reached agreement to register NetTel as a *COMPANY LIMITED BY GUARANTEE AND NOT FOR PROFIT* in Tanzania. The Articles of Incorporation state that the Executive Council will govern the NetTel @Africa network, formulate Policies and programmes of the Network, supervise implementation by the Secretariat of the policies and programmes of the Network, evaluate implementation of the policies and programmes of the Network, approve the budget of the Network, and appoint and/or dismiss Directors of the Secretariat of the Network. The Executive Council shall be the highest organ responsible for the management and control of the network in terms of policy making and strategic direction as well as overall monitoring and evaluation of the network's performance. The Executive Council will replace the hitherto Advisory Council and its composition shall be as follows:

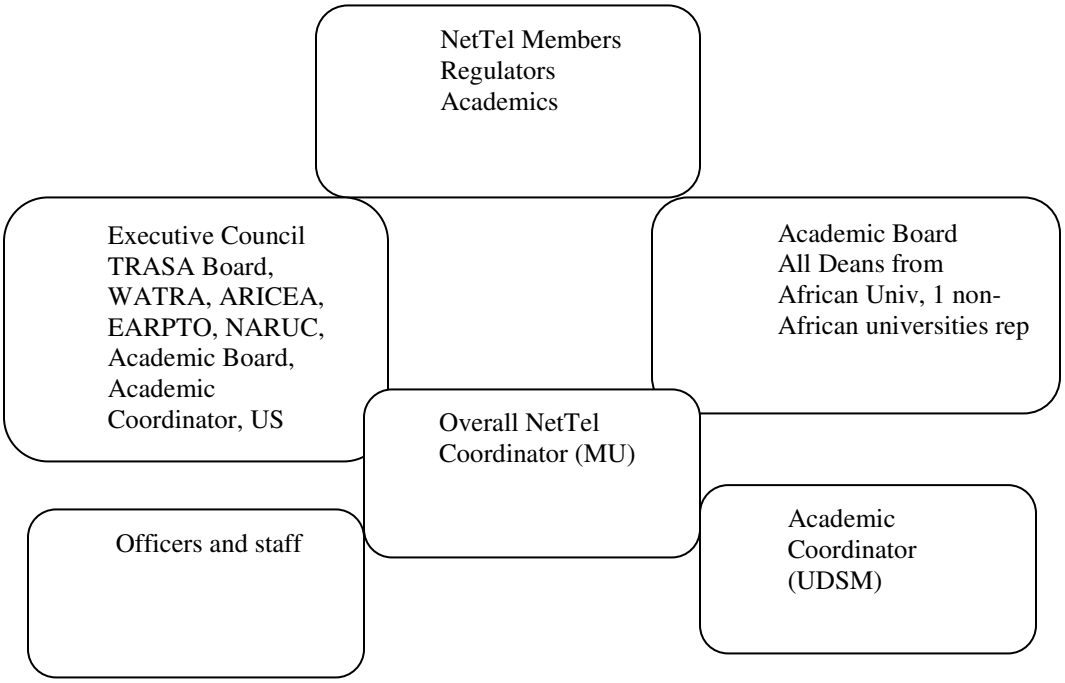
- TRASA (2)
- ARICEA(1)
- EARPTO(1)
- WATRA(1)
- Policy Makers(1)
- Academics (1)

Academic management

As per the MOU signed among African universities, the Academic Board is composed of Deans of the Faculties in the different universities and institutions that will participate in the training component (African and non-African) as well as a representative from the regulators (1), policy makers (1) and the private sector (1). The Academic Board shall be responsible for the broad academic policy, strategic direction, and quality assurance within a loose network that recognizes the independence and unique character of each training institution. They will also approve curriculum, content, delivery, and internal assessment methods (while recognizing the loose nature of the training network). They will also approve the technical aspects of course delivery and digital tools for eLearning.

The first Academic Board meeting held in February 2005 and hosted by the University of Western Cape reviewed important lessons learned regarding academic management. These include ensuring a common calendar, management of homework and final exams, and release of grades within two months. Twenty eight participants showed up for the first academic board meeting, representing 19 academic institutions from 11 countries. The agenda included considering proposals on effective local academic management: Program management; Developing local instructor capacity; Examination processes, procedures, and deadlines; proposals on the job description, qualifications, terms of service, and method of identifying the Academic Coordinator; proposals for the Academic calendar. These documents which reflect the decisions made at the meeting are available at http://www.NetTelafrica.org.

Figure 2: NetTel's Governance Structure



University of Dar es Salaam (UDSM) – Academic coordination.

As indicated earlier, UDSM was chosen as the Academic Coordinator. The Academic Coordinator will be administratively responsible to the NetTel academic board, but working under the guidance of the overall Network Coordinator. The first two years focused on drafting and signing the MOU among African universities. The Academic Coordinator's primary function is to enable the work of the Academic Board and the NetTel Coordinators.

Makerere University – Overall NetTel coordinator

Makerere University, acting as the UK Department for International Development (DFID) / Swedish Agency for International Development (Sida) CATIA 1e Program Secretariat, has initially taken the lead in the expansion of NetTel beyond Southern Africa and harmonizing the Africa to Africa peer program. Beginning July 2005 Makerere University started to take the lead in overall coordination of NetTel. Overall coordination involves harmonizing the four NetTel components--training, peering, research, and ICT applications.

CBDD/WSU Role

CBDD, worked with TRASA, to set the stage in the formation of NetTel. CBDD has acted as a bridge among regulators and academics and among African and Americans, facilitated capacity building activities, and provided financial oversight for USAID funded activities. Acting as the third party executing agency, Washington State University (WSU) has formalized agreements with several select partners to facilitate development efforts that require funding.

Subagreements signed include:

1. University of Botswana
2. University of Dar es Salaam
3. University of Fort Hare
4. University of South Africa
5. University of Western Cape
6. University of Witswatersrand
7. University of Zambia
8. Makerere University
9. University of Florida
10. University of Colorado
11. NARUC

Success factors in building NetTel as an alliance

NetTel as a strategic alliance combines the complementary strengths of government, the private sector, and the academic community to broaden and deepen the development impact in the ICT and telecommunications sector. Partnerships, alliances and networks have been used interchangeably in economic development. "Partnerships are defined as "relationships that provide opportunities for mutual benefit and results beyond what any single organization or sector could realize alone" (Drucker Foundation, 2002). The relationships consist of shared and/or compatible objectives, with specific roles and responsibilities among the participants which can be formal, contractual, or voluntary, between two or more parties (NALD, 1995). When the partnership is characterized by a cooperative arrangement and is governed by a formal but incomplete contract (Gomes-Casseres, 1996), an alliance is formed. Interconnected alliances create networks (Gulati, 1998).

How then does NetTel embody the vision of a Global Development Alliance? What are the key success factors?

Common goal

One of the most important lessons to emerge from NetTel is the importance of a commitment to collaboration, as well as of allotting sufficient time to implement the collaborative process during the development stage. In NetTel's case, the collaboration required to kickstart the process necessitated almost 18 months of sustained conversations in order to articulate a shared vision and common goal.

While "projects" (formally defined as sets of activities leading to clear and measurable objectives within defined timeframes) were important components of NetTel, the process of project formulation was even more critical. This project formulation took place in what might be called an "alliance" mode, where the program manager assisted a diverse set of potential alliance members to articulate a common goal. Then, through a process of iterative consultations, consensus building, and workshops, the alliance was formed, with specific roles and near and intermediate-term objectives. Individual components were essentially stand-alone projects in and of themselves, but all contributed to a common goal. The overall success of the program was the accumulation of results from the components, all contributing toward that common goal.

Trust and maintaining trust

> *NetTel, is a network of an interconnection of communicating entities with high trust expectations.*

Another important lesson is the ebb and flow of trust. When first invited to join the network, none of the parties knew each other. Yet at the initial brainstorming session there was a willingness to form an inter-organizational network to collaborate towards a shared objective. This willingness to commit to a collaborative effort before knowing how the other party will behave is pure and simple trust. The collaborative effort's sense of purpose helped foster a super-ordinate group identity that extended beyond local boundaries. A shared identity has been shown by studies to lead to increased trust (Kramer and Brewer, 1984) as well as greater cooperation (Dutton, Dukerich and Haruquail, 1994). Because network partners were geographically distributed, communication was primarily via email and sporadic phone conversations which was augmented with face to face interaction. These face to face interactions were crucial for increasing familiarity with each other, fostering understanding of cultural norms and creating a common frame of reference to accommodate differences and to build trusting relationships. Communication included work related and non-work related topics (*I have a new baby*, *We are mourning the loss of our brother*, *He is still on his honeymoon*). Non-work related communication, such as disclosures of feelings about personal joys and frustrations and discoveries of common interests, also provided avenues of informal internal assessments of trustworthiness of others, thereby contributing to emotional trust (Rocco and others, n.d.). As a sender and receiver of work related communication, prefacing, embedding or ending with non-work related communication even via email maintains a trusting tone.

While in the beginning there was trust, during the course of the network development manifestations of distrust arose, as were evidenced in third-party reports and in members' reluctance to commit without having guarantees about the other party's behavior. The most telling example of the latter is during the articulation of a memorandum of understanding between the various higher education institutions. Individuals who were most engaged in the network had to commit their institutions to actions that are not within their own sphere of control. The trustworthiness of quality assurance committees of the other parties, the trustworthiness of tools to assess student learning outcomes, and the trustworthiness of teaching credentials came into question. However, statements made were never in the form of "*I do not trust your quality assurance*" but rather turning the individual's own organization into a third party "*the faculty senate is reluctant . . . , not me personally."* To mend this distrust required more paperwork, but more importantly face to face meetings so that those in decision making positions could assess the trustworthiness of the network partners and move towards "owning" the shared objective and broader goal of the network. Nevertheless, the signed memorandum of agreement served as a "surrogate of trust."

When trust is broken between parties due to missed deadlines or when deeds are not consistent with promises made or when expectations are not met, parties remain open to mending trust by avoiding antagonistic attributions [*I was not clear about my expectations*], by legitimizing the pain and addressing isolation [*it's great to see I am not the only one suffering*] and by building collaborative solutions [*how can we make this work*] requiring a compromise [*I am beginning to understand what is going on, here is what I can do*].

> *With NetTel, the challenge has always been figuring out how to strengthen ties so that emotional trust and cognitive trust work together to achieve common objectives.*

The role of NetTel coordinators in managing trust

Moreover, the successful operation of a network, such as NetTel, especially one that is predicated more on the use of information and communications tools rather than face to face interaction which is not always possible and feasible, requires installing appropriate coordinators. Goransson and Schuh (1997) and Hess and Schuman (2000) suggest the necessity and centrality of anywhere from one to five network coordinator(s) responsible for catalyzing cooperative relationship among network partners requiring trust building. These network coordinators must bring with them two main bases for trust:

(1) the personal traits of the individuals adopting them, like attributed competence and motives and (2) the role based-trust, an impersonal type of trust or ". . . a form of depersonalized trust because it is predicated on knowledge that a person occupies a particular role . . ." (Kramer, 1999). The coordination roles represent what Giddens (1990) calls *access points for the development of trus*t or what Coleman (1990) refers to *as intermediaries of trust* (1990).

In the case of NetTel, there are coordinators at each of the institutions who ensure that their part of the whole is accomplished and who interact with the other institutional coordinators. There is an academic coordinator whose responsibility is to ensure that academic issues, such as, recognition of credits are addressed, as well as development of a common calendar, including scheduling of exams. There is a coordinator for bridging the academics with the practitioners and expansion of the delivery of learning materials to other areas. There is a coordinator for the development of the online learning management platform. And there is an overall coordinator. The roles are clear but from time to time there is a perceived uncertainty about the intent of the behavior or the behavior of other coordinators. All will say enhancing trust is not part of their position description. However, as indicated in the examples above, distrust or perceived uncertainly is not conveyed directly to the other party who has broken the trust but more often conveyed to a third party. This poses a dilemma for a coordinator who receives information as a third party: what to do with that information, who to convey it to and how to convey it so that broken trust can be mended or trust can be sustained.

To summarize, the formation of an inter-organizational network as in the case of NetTel is driven by partially overlapping objectives: a collaborative advantage of increasing benefits while reducing risks, deriving benefits from economies of scale or scope, co-opting competition, and achieving synergy effects. To join a network it is necessary not only to trust others before acting cooperatively, but also to believe that the trust is mutual, that one is trusted by others. However, as the network develops, trust will either deepen or erode depending on how the spiral of reciprocal expectations is met or unmet and how judgments of trustworthiness are tested overtime. Holding the network together requires managing trust. Because of the multiple complexities inherent in networking, the usual person to person, person to organization, inter-organizational trust must be viewed within overlapping networks that consider not only the diverse skills among the network partners but the attendant cultural norms. The final product of NetTel is the combination of outputs and results from multiple sub-processes where the whole is bigger than the sum of its parts. Coordinating a network to achieve its objectives requires managing trust, not only at the implicit level but at the explicit level. Thus, the network coordination role must nurture trust-enhancing behavior by continuous sharing of relevant information, clarifying mutual expectations, meeting expectations, and allowing for mutual influence. This sense making on trust in a geographically distributed, culturally diverse network has raised several questions that have implications for leadership in alliances, such as NetTel:

- How best to use information communication technologies to approximate face to face interaction;
- How best to nurture the network so that it will evolve toward a state of balance in which people are bound by strong relationships as well as have similar judgment of trustworthiness of others;
- How best to translate trustworthiness in network partners to trustworthiness of web applications developed by the network partners, such as the online learning management system not just for content management but also for reliability of online internal assessment.

Affirmations regarding the Alliance experience

During the NetTel meeting at Delft (June 2005), a set of questions were posed as part of the appreciative inquiry. Results from three questions relate to the alliance experience and the following affirmations were gleaned from the interviews.

Q 3. *Describe the best collaborative experience you have had within NetTel. What did you do to make it a peak experience? What did others do? What kind of support did you have from your University (regulatory agency)?*

Specific course development activities, curriculum and learning modules in general were described as good collaborative experiences. Seeking financial support as a cooperative group was also identified.

Many respondents said the best experiences could not be individually identified, but the overall collaborative environment between peers (academics, regulators, etc.) was of immense benefit. It helped form friendships, cement working relationships, understand the online tools, appreciate the participatory approach, and spend less time on non-academic duties.

Some also identified the creation of open source tools as a good collaborative experience; the creation of KEWL in Africa as a contribution to the open source movement was highlighted as a valuable achievement.

Other respondents also admitted they had not had much collaborative activity with NetTel.

Most said their universities helped them devote time to NetTel, and the NetTel initiative itself helped them with funds for participation.

Q 5. There are many roles that link students to instructor to regulator and to the community. What do you value about your role in creating policies that enhance capacity for community members?

Most respondents focused on opportunities to create cross-meshing of stakeholder interests, bringing in members of the larger community, facilitating larger developmental impacts (eg. including disabled communities), and networking researchers and educators.

Some saw their role as bringing in and bridging external knowledge, with the university playing a major role in outreach. Helping community members empower themselves, providing ICT leadership and building academic capacity were other identified roles. Specific activities like e-governance and telecentre creation were also identified.

Q 7: What can NetTel do to foster collaborative policy development at an even higher and more consistent level, throughout your community? Describe how these policies will link together to improve life in your community.

Several respondents recommended that NetTel should focus on regional and continental strategies, and languages other than English. This could be via setting up of regional centers of excellence and regional agencies, and expanding to languages like French and Portuguese. Simultaneously, more networking within each country should be promoted.

NetTel should dialogue with and influence politicians as well. More universities should be roped in, while at the same time addressing real problems of the industry and society. Collaboration with other universities in the US and other parts of the world should be encouraged. Creation of regional ICT infrastructure backbones should be supported.

Q 10: In the discussion we have had so far, what is the role of gender? How has the gender issue been treated in NetTel educational settings and telecom policy? What are your recommendations on this front?

It was felt that in Africa, racial divide issues have dominated the discussion about disadvantaged communities, but gender issues should not be overlooked. Some respondents called for greater involvement of women in academia, engineering, entrepreneurship communities and regulation. While tokenism should be avoided, gender should also be nuanced along with the other divides in Africa.

Best practices identified on the gender front including setting specific targets and quotas for including women in ICT education, lowered fees for women students, and even governmental support in the form of ministries and ministerial positions. More women role models need to be created and women should be taught not to be afraid of technology. There should be gender awareness creation for ICT policy makers and regulators, including Nettel instructors.

Capacity building results: highlights

Outputs and outcomes

NetTel's capacity building network is strengthening the telecommunications sector in Africa through four key components. The status of each component is summarized below:

1. Training Component
   - Module and Coursework content development (completed for 10 courses at the Post-graduate diploma and 10 courses at the Masters level).
   - Delivery of Program via eLearning (pilot year for postgraduate diploma completed 2004; Masters to start in July 2005).

2. Peering Component
   - Exchange programs and field attachments (underway).
   - Secondments (underway).

3. Collaborative Research Component
   - AfricaDotEdu (completed 2003).
   - Policy and regulation symposia (July 2004).
   - Survey of Telecenter use in Kenya and Rwanda (ongoing).
   - Student mini-thesis (ongoing).

4. ICT Applications for Development
   - Knowledge Exchanges and Learning Partnerships (four established by South African Partner institutions)
   - Online learning management system (KEWL and KEWLNEXTGEN; ongoing 2005)
   - Youth for Business and Information Technology in Rwanda (ongoing)

In addition, there are two cross cutting themes:

1. Gender-sensitive monitoring and evaluation (course developed December 2004).
2. Network Development and Information sharing program (completed 2004).
   - Information website http://www.nettelafrica.org
   - Online learning website http://kng..nettelafrica.org

Training component results

Strengthened capacity of African academic and training institutions required assistance in three areas: (1) content development, (2) pedagogy of teaching and learning with ICTs, and (3) hands-on experience with an online learning management system (KEWL, as the first version and KewlNextGen as the revised version.

Content development results

The ICT/telecommunications post-graduate diploma and masters degree program is based on a combination of the courses in Figure 2. Partner universities can mix and match courses for different specialization tracks or streams. Each course is made up of two or more modules. The experts and practitioners in the sector met several times with the academics to identify the knowledge requirements that became the modules for the courses. Peer review was aided by the use of a rubric for elearning and a rubric for content. The postgraduate courses have gone through peer review while the masters level courses are scheduled for peer review before January 2006. The courses are available online. Each course has explicit learning outcomes, e-lectures, learning activities (including additional reading materials), and learning assessments, combining coursework with final examinations. See Table 2 for a sample course objectives and learning outcomes for the Gender course. A course catalog is available at http://www.nettelafrica.org.

Figure 2. ICT/telecommunications policy and regulation courses

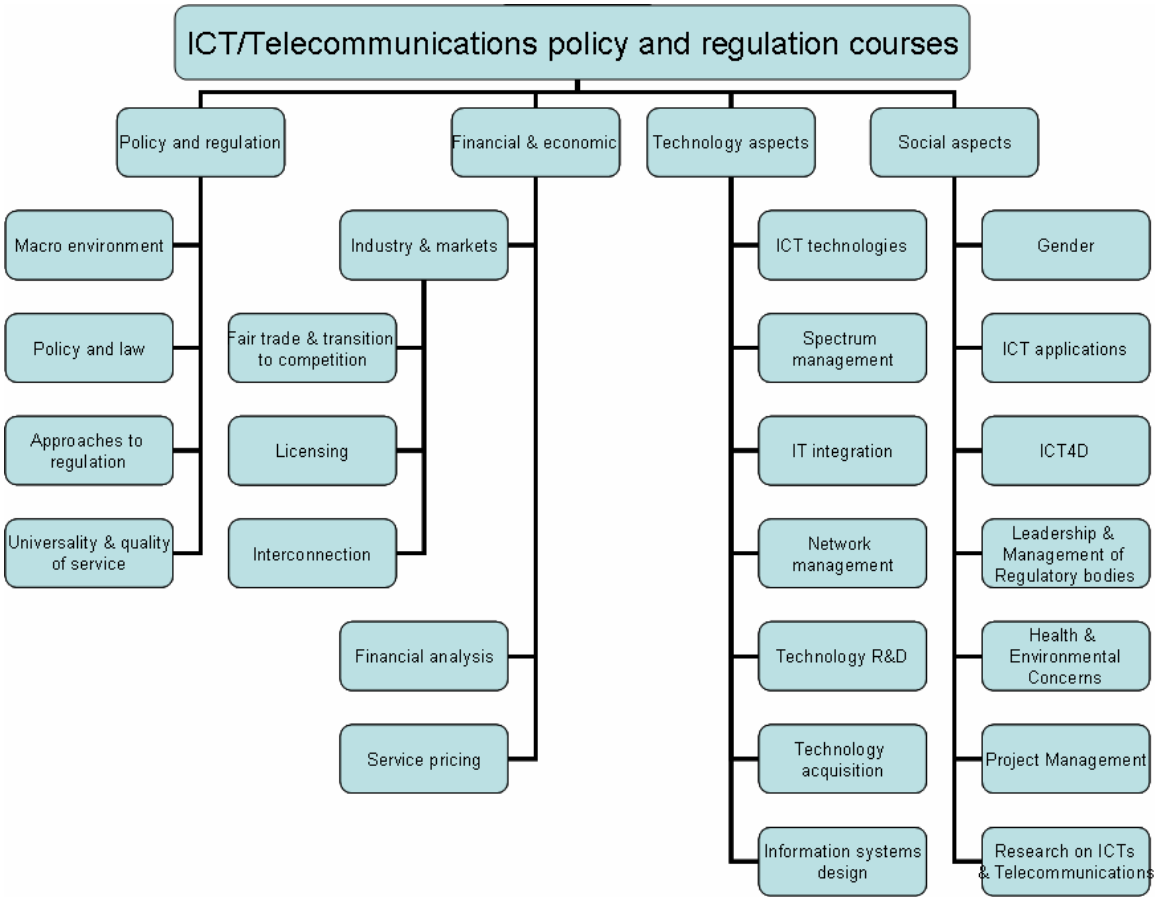


Table 2. Sample course objectives and module outcomes: Gender

"It has been acknowledged that gender is an important component of any policy, and its implementation. For countries to achieve universal access to ICTs and for ICTs to lead to sustainable development, gender issues/concerns should be mainstreamed in organisational structure, the policy, project design, implementation, monitoring and evaluation.

The Gender, ICT Policy and Regulation course is intended to introduce to NetTel @Africa policy makers and regulators what is meant by gender, the key gender concepts and theories, why gender is an important component in development and ICTs and provide them with skills to gender mainstream the policy process and regulatory procedures."

-Consolata Kabonesa, Lead Instructor

Course Objectives

At the end of this course the learner should be able to:

- Explain gender concepts and application of gender theories
- Create awareness of gender issues in the development process
- Develop skills in gender analysis
- Examine the process of mainstreaming gender issues in ICT Policy and Regulation
- Develop skills in gender mainstreaming process
- Develop skills in monitoring & evaluating gender responsiveness of programmes

Module 1: Understanding Gender

At the end of this module the learner should be able to:

- Differentiate between gender and sex
- Compare/contrast the situation and relationships of women and men in society
- Discuss cogently the theories of identity creation
- Understand and identify sex stratification issues in society
- Be able to describe theories of empowerment
- Identify gender development issues specific to Africa

Module 2: Gender and ICTs

At the end of this module the learner should be able to:

- Explain the historical perspective of gender issues in ICTs
- Discuss cogently gender issues in ICT
- Explain and discuss the various barriers of access to and use of ICTs in terms of: infrastructure, socio-cultural issues and skills.
- Discuss the various ICT policies in an African context
- Perform an ICT policy analysis from a gender perspective

Module 3: Mainstreaming Gender in ICT Policy and Regulation

At the end of this module the learner should be able to:

- Discuss the steps of a gender mainstreaming strategy for gender equality
- Design an action plan for mainstreaming gender
- Design a policy for gender mainstreaming and be able to implement, monitor and evaluate the policy
- Understand and develop gender sensitive indicators

Pedagogy of teaching and learning

Of note are the evolving institutional changes that are starting to occur. These transformative changes represent one level of impact. Collaboration rather than competition among the university partners has become the priority. Partner universities have become co-developers of content rather than mere users of content developed elsewhere (old syllabi have been replaced and new material developed with links to digital resources). Delivery is across national borders and across time zones. Instead of knowledge being hoarded, it is shared, and the paradigm shift from a traditional to a restructured educational setting is starting to manifest itself. Table 3 (Keats and Beebe, 2004) summarizes key changes that must continue to occur in universities to make NetTel work. These changes are transformative in scope and it will take more time for the universities to make a complete shift. Table 5 is a summary of areas for improvement in the delivery of courses via eLearning.

Table 3. Evolving institutional changes to make NetTel possible

Area	The traditional Academic culture	The Continuum	The emerging academic culture
Business approach	Competitive	⟺	Cooperative
Content	User	⟺	Developer
Delivery	Within institution	⟺	Across borders
Educational processes	Discipline specific	⟺	Multidisciplinary
Focus	Internal processes	⟺	Collaborative processes
Flexibility	Restrictive	⟺	Flexible
IT System	Defined by producer, inflexible	⟺	Defined by user, adaptable
Knowledge attitudes	Hoarding	⟺	Sharing
Learning	Confined	⟺	Open
Pedagogy	Teacher-centered	⟺	Learner-centered
Perspective	Narrow	⟺	Broad
View of other institutions	Suspicion	⟺	Trust

Keats and Beebe (2004)

The observations above are consistent with the response to one of the interview questions asked at Delft.

Q 4. Recall the best policy change you have experienced at your university (regulatory agency). What factors made it the "best" experience? What was it about that experience that makes it stand out from other policy change experiences?

ICT usage and e-learning was very uncoordinated at some universities; now there are mandates to use ICT, for support and for academics and students to use them. Specific initiatives have also focused on e-learning for staff. One campus even has an MS degree offered through e-learning. Campus Information Systems have helped the use of ICTs as educational tools; so has the use of satellite links for downloads.

Non-ICT policy changes mentioned included better accreditation systems. Some campus policies have helped academics focus more on larger macro issues than operational issues; other policies include promotion of local content, rural community development, connected economic development and policies for the disadvantaged communities.

Results regarding the technologies used to deliver the NetTel courses

Instructors reported that they were able to effectively upload, edit and update course material on the KEWL site (80% of respondents answered with some level of agreement). A large majority of instructors found the site easy to navigate (84%) and none of the respondents indicated that it is difficult to become comfortable with KEWL. Instructors indicated that they were able to effectively use ICTs (KEWL, offline CDs) to deliver the course(s). All instructors responded that KEWL was at least somewhat effective for delivering courses. In terms of expertise with ICTs, instructors used internet browsing and email most frequently and report themselves as being a mid level user with regard to KEWL. See Table 4 which highlights advantages of KEWL based on discussions at Delft.

Table 4. Advantages of KEWL

The results from the questionnaire are consistent with the views expressed during the discussions at Delft. The advantages of KEWL as reported by NetTel instructors included the online discussion forums, ability to work across multiple time zones, internal assessment tools, and online examinations. But at the same time, problems were reported with respect to harmonization of participation, performance under conditions of low bandwidth, continuous internal assessment tools, and mechanisms to check practices of academic dishonesty such as cheating and copying material directly from other Web sites. It was recommended that commitment is a way to tackling some of these problems; better bandwidth (e.g. independent rather than shared Internet access), special capacity building sessions for new staff, and complementary institutional workshops were also suggested. One of the key issues raised was the promotion of better quality discussions online and offline. Suggested remedies included providing clear response criteria and expectations, providing online literacy seminars early in the course, inviting guest participants, and using student leaders.

Results regarding student/instructor interactions and student/instructor performance – from the instructor perspective.

Forty percent of instructors reported that they were able to effectively communicate with their students, however, there were many who indicated that they were not able to at all. Instructors report that communication with students occurred most frequently through instant messaging and the telephone (respectively). Discussion forums and email were reported as the least frequent modes of communication with students. Instructors spent an average of 11 hours logged in to KEWL each week and 12 hours each week working offline on the. The instructors made an average of 5 postings to the discussion forum for their course each week.

Instructors report that, on average, 45% of their students fully utilized KEWL's resources. When the students posted to the discussion board instructors responded that student postings were of high quality, but that there is still room for improvement. However, instructors also report that the balance between quality and quantity of those posts needs improvement. The following comments from various respondents elucidate these data:

"My experience has been that only one or two students post any message of significance. [A] majority do not respond to the messages, and when responses are forthcoming, they are invariably from a source that had an original post."

"Many students participated weekly. Many fell behind the schedule. Good students made good, lengthy, comprehensive postings. Too many students plagiarised - copying off web sources. Some students were almost illiterate and should never have got into the course."

According to instructors, their course deadlines for assignments and internal assessment were clearly indicated. However, according to the instructors, only 34% (on average) of their students complied with those deadlines. In contrast, 75% of instructors reported that they are confident their students can complete research in the telecommunications sector after graduating from the NetTel PGD program.

Student response

During the NetTel Scholars Symposium held in July 2004, students were engaged in several forums in which they could provide verbal and written feedback. Below is a summary of their responses.

Verbal Feedback

- The timely response from the NetTel Executive Agency (WSU) was appreciated.
- The scholarships are greatly appreciated.
- The program objectives are meeting the needs of the student's country, institutions, and societies.
- The software (KEWL) is appreciated. User friendly.
- The content is well designed for student needs.
- The symposium has been a very useful activity.
- Recognition by the regulatory community of Students participating in the NetTel PGD is appreciated
- The opportunity to work simultaneously while going to school is valuable.
- NetTel's PGD programme has greatly broadened the Students' knowledge base.
- Enrollment in the programme has served as an inducement for Students to have computers in their homes so they can work on their coursework at home.
- Students have greatly expanded their understanding of the role of the regulator.
- The idea of participating in an eLearning course is a joy, a privilege.
- KEWL enables the Students to share experiences with Students from other countries.
- KEWL provide materials that are applicable to real life.
- The mix between working and learning simultaneously is a great opportunity.

Written Feedback

- The programme is well tailored; the KEWL is easily accessible and easy to follow.
- Relevant information to actual regulatory decisions. KEWL is excellent because we do not have to attend formal lectures - this would be extremely difficult if you are employed full time.
- I like because the materials are relevant to the current global development agenda on ICT policy and regulation.
- The in-depth explanation about ICT-based services and programmes as well as applications.
- Knowledge rich as far as regulation and policy formulation. KEWL can be a little is improved.
- It is user-friendly, easy to understand, materials are good, a lot designed activities like message, chart, Q&A elibrary are quite helpful.
- The discussion forum, the courses are very informative.

- It is the course designed in the practical environment/situation (e.g., it relates to regulators/operators/users). KEWL is good, but the time-out for log-out is too short.
- The KEWL should include multimedia features, especially in explaining the complex topics. The posting area in the KEWL should be improved so that accepts the graphics.
- NetTel PGD is really impressed me with its learning environment (KEWL), due to its applicability, interaction and it fits to the current need of my country.
- Discussion board application of the use of participants statistics feature. Chatting facility though it has not been used very effectively. It has to be improved further.
- Ability to get information at the click of a button.
- The interaction with other Students from different countries is good so that we really understand, not only what is done in South Africa, but in other African countries as well. Also, anytime, anywhere access to information as we are employed for 8 hours or more per day.
- What I liked mostly about the programme is that it addresses issues of policy formation and implementation and regulatory issues which my country is currently trying to resolve.

With the shift from KEWL to KewlNextGen, it would be easier to do pre- and post-test through online questionnaires for each cohort of students. The developers at UWC have successfully created a survey module that will soon be installed onto KNG. This module allows one to establish pre and posttest surveys – that can be linked to and from the course content. The survey module supports a plethora of question types (e.g., Likert-type, rating scales, open-ended, etc.) that will allow the development of psychometrically sound instruments. The system has several additional features that will allow for simple and accurate data collection. The module has settings to control anonymity, multiple responding, forced question responding and will also do basic descriptive analyses of the responses. Further, the system will be able to export the data to files that are readable by SPSS and Microsoft Excel.

Again these data will serve as a baseline assessment. It was necessary to wait to assess instructor performance during the first year to begin this particular assessment. Now that the instructors have experience creating and implementing online courses it should be possible to track their performance changes in the future. These questionnaires will be administered on a semester basis (for students and instructors) and an annual basis for regulators.

Table 5. Areas for improvement: eLearning

Since the NetTel program started, there has been one core person responsible for conducting each of the courses, setting and marking coursework, setting and marking assignments, and moderating online discussions. This has had the advantage of students around the continent interacting with each other, widening their scope and outlook. However, working with multiple partner institutions has setbacks. These setbacks were discussed at the first academic board and a proposal to address these setbacks was accepted (a) to ensure that the local institution owns and takes full responsibility for administering the program locally including enforcing of quality and deadlines, and (b) local capacity is identified and developed right from the start. Other specific recommendations are as follows:

Academic Staff

1. It is recommended that as a pre-condition for signing the MoU, universities intending to join the network should submit a formal list of lecturers for each of the courses offered by NetTel@Africa. Such lecturers must have the minimum competence specified in the MoU for each of the courses in addition to meeting the requirements of the host institution.
2. There will be a lecturer locally responsible for each course, including periodic face to face interactions with the local students, administering and marking assignments, and administering and marking the examination.
3. The Course Developer and Backup will act as resource people for the lecturers at other universities to enable them develop their capacity to run the course independently.
4. A full program for academic staff capacity building should be formally initiated.

Instruction and examination

1. At least two assignments that cut across all institutions will be set in each course to enable the many to many learning interaction.
2. One common examination will be set across the network for each course.

Administration

1. The Head of the relevant university structure where the program is resident will be responsible for the proper academic management of the program at the Network Partner University, including enforcing deadlines.
2. The program shall be administered at high level by the Senate or equivalent just like other programs at the host institution.

Timing

1. All examinations shall be set six weeks before the date set for the start of the examinations, moderated by an internal examiner, and sent to the external examiner at least four weeks before the start of the examination period.
2. The Academic Coordinator will be notified of all results within six weeks after the end of the examination period.

Peering component results

The Peering Pillar complements the Training Pillar by creating opportunities to share experience and expertise between and among different regulatory bodies. This fosters partnership and networking among African regulatory organizations and associations, and therefore builds a body of shared African expertise and experience on which regulators throughout the continent can draw. An effective peering network, like an effective African training network, is already showing results by enhancing continental self-sufficiency, spreading best practice and reducing the reliance of African regulators on non-African consultancy and other expertise. Approaches developed and successful within Africa are likely to prove more relevant and more cost-effective than resources recruited from outside the continent.

The **Peer-to-Peer (P2P)** exchanges have been broadened to focus on three types of relationships among and between Africans and their non-African peers: academic-to-academic (closely tied to the training program above); regulator-to-academic (linked to the training program); and regulator-to-regulator (fostering reciprocity agreements for training and knowledge sharing between regulatory bodies, mostly within Africa, but also with regulators outside Africa). The regulator-to-regulator peering is becoming more active. While initial exchanges were mostly between African regulators and USA regulators, the greater volume is now among African regulators, especially with the increasing recognition of the relevant expertise and experience that has increased within Africa.

The peering network uses two means to achieve this sharing of experience and expertise: (a) bilateral activities, *i.e.* individual secondments and attachments; and (b) group seminars and workshops. Secondments take place when expert individuals from one regulatory body visit another regulatory body seeking expertise. Attachments take place when individuals from the regulatory body seeking expertise visit the regulatory body making that expertise available. Bilateral activities of this kind add an important dimension of experience-sharing which cannot be provided through group activities or academic training, offering detailed and specific expertise and guidance from fellow practitioners on issues of direct and immediate relevance to the countries concerned. Group seminars and workshops are organised by the peering network where there is extensive demand from other countries to share experience in a particular issue. Table 6 summarizes the areas for improvement and for sustainability of the peering component.

Bilateral peering

1. Percy Mangoela (Lesotho Telecommunication Authority) visited to FCC, North Carolina, Washington, DC and Washington State. The outcome of his visit is a concept paper for NetTel to develop and Executive Development Program.
2. F F Tusubira (Uganda Communications Commission) read a paper at the NARUC western meeting in Alaska.
3. Funlola Akiode (Nigeria Communications Commission) visited Washington DC PUC and Oregon PUC (NCC funded). The outcome of her a visit is a list of resource speakers to be invited by the Nigerian Communications Commission.
4. Dale Hatfield (University of Colorado) visited with the Nigerian Communications Commission to help with their Spectrum Management template.
5. Denise Parish (Wyoming PUC) visited with the Nigerian Communications Commission to help with their regulatory accounting. She was then invited as a resource speaker to an ITU workshop on regulatory accounting.
6. The Rwanda Utilities Regulatory Agency sent one member of their staff for a 1 week secondment with the Nigerian Communications Commission.

7. Rita Ssemboga (Uganda Communications Commission) was seconded to the Ethiopian Telecommunications Agency to share experiences on price cap regulation and costing methodologies.
8. Uganda Communications Commission and the Nigerian Communications Commission each sent two of their staff to Industry Canada.
9. Ms Joan Smith (Oregon PUC Commissioner) spent time with the Rwanda Utilities Regulatory Agency.

Seminars, workshops, hot topics

1. Botswana launch: **(Outcome: Declaration of Partnership)**
   Mike Martin – University of Colorado
   Tom Wilson – Washington State PUC
   Tom Welch – Maine PUC
2. COMESA Capacity Building: **(Outcome: formation of ARICEA and capacity building plan of activities)**
   Fred Butler (New Jersey PUC)
   Paul Margie (FCC)
3. NetTel Safari (Botswana): **(Outcome: Peer reviewed materials)**
   Examples of presentations done
   - Scott Savage – Real options, investment and regulation
   - Brett Perlman – Interconnection and service pricing
   - Jim McConnaughey – Rural access
   - Brad Ramsay – ICT, telecoms and international law
   - Bill Gillis – Elements of public policy supporting ICT applications
   - Nan Thompson – Consumer empowerment
   - Richard Mwanza – The challenges of globalization on telecommunications
   - Carel van der Merwe – Wireless and broadband
4. **W**orkshop for Judges and Lawyers (hosted by the Nigeria Communications Commission): **(Outcome: awareness raising for stakeholders from the legal profession)**
   Tom Barkin – Oregon PUC
   Paul Margie – FCC
   Michael Copps – FCC
5. NetTel Telejamboree: **(Outcome: capacity building for academics and regulators)**
   Billy Jack Gregg – Consumer Advocate from West Virginia PUC
   Shola Taylor – CTO
   Dr Mark Jamison – PURC
   Dr Tim Wedig – University of Maryland
6. Safari at the Equator: **(Outcome: capacity building for academics and regulators beyond southern Africa and buy-in to NetTel)**
   Nan Thompson – Alaska PUC
   Jo Anne Thompson – North Carolina PUC
7. ECOWAS Ministerial: **(Outcome: draft wireless guidelines for the region)**
   Scott Delacourt – FCC (Wireless)
8. Voice Over IP (Rwanda Utilities Regulatory Agency): **(Outcome: draft module on Voice Over IP and draft guidelines)**
9. Executive Development Program pilot test (TRASA and Lesotho Tecommunications Agency): **(Outcome: Executive Development Program)**
10. The TRASA Executive Board, COMESA , and Morocco sent participants to the NARUC meeting in Portland.
    - Thapelo Mogopa, TRASA
    - Kagiso Baatshwana, TRASA
    - Twoba Koontse, BTA

- Susan Mulukiti, ZCC
- Col Nalingigwa, TCC
- Victoria Byoma, UCC
- Omar Mouddani, Morocco[5]
- Gilbert Maeti, COMESA[5]
- Francis Kituto, USAID[5]
- John Omo, KCC[5]

11. Karl Socikwa was invited by NARUC to present a paper on Broadband Africa.

Table 6. Areas for improvement: Peering component

There are three key areas for improvement and for sustainability of the peering component:

1. An establishment and formal framework through which regulators and/or policy makers share expertise on a bilateral basis through secondments of attachments.
2. An established mechanism for identifying capacity building needs that would benefit from joint learning activities involving several regulators and/or policy makers, and implementing such activities.
3. Ongoing coordination of the peering arrangements.

Formal Framework for Peering

The formal framework for peering has been defined in the Peering MoU. Challenges of governance that faced NetTel@Africa at the start delayed the formal adoption of this MoU by the regulatory agencies. This has now been formally approved by the Executive Council, and its consequent signing will formalise the network, with specific rights and obligations of membership.

Mechanism for identifying and implementing joint activities

This requires a continuous scanning of the policy and regulatory environment in African countries, and working with policy makers and regulators to identify capacity building challenges as well as agencies that have developed expertise they can pass on to others. It requires periodic interaction with policy and regulatory agencies.

Ongoing coordination

The logistics of identifying needs, setting up linkages, moving people around, receiving and analysing reports to inform strategy, as well as monitoring and evaluation, calls for a competent human resource familiar with policy and regulatory challenges and activities across Africa and the world. The estimated time input is 75% of a full-time equivalent. This level of time demand means that an employee has to be formally engaged as Peering Coordinator. It has however been agreed that in the interim, the Peering Function is taken on by the NetTel@Africa Director.

Research component results

The **Research Program** provides an opportunity for students to research the ICT sector that can then add to the knowledge base of the courses that compose the Training Program. The research also serves as a platform for benchmarking the experience of African regulators and for tracking the performance of the sector.

While some specific research, including policy briefs, has been carried out, this arm is still in its formative stage, and will be better defined over the next twelve months. There are however strong linkages to Research ICT Africa! (see http://www.researchictafrica.net/), a network of African Researchers in ICT policy and regulation around the continent. These are predominantly universities, and they have already generated a good number of consistently researched African cases that add value to both training and peering activities. Moreover, there should be small research funds set-aside to fund the suggested topics in Table 7.

The recently published book titled *AfricaDotEDU* is one of the most visible outcomes of the Collaborative Research Program. This unprecedented compilation of scholarly essays provides comprehensive statistics, analysis and roadmaps for the future of the Internet in African education. Topics covered in the 24 chapters range from digital libraries and country case studies to national IT policies and e-learning. More details about AfricaDotEDU are available at: http://www.africadotedu.org/.

NetTel Scholars Symposium (to be published)

- Karl Socikwa – Broadband Africa
- Nkenke Kekana – Policy and regulation in the era of convergence
- F.F. Tusubira – Crystal gazing: Policy and regulatory challenges in the regulatory environment of the future
- Justine White – Challenges facing independent regulators in SADC
- Nan Thompson – Voice over IP and challenges for regulators
- Vanessa Phala and Marco Machona – Regulatory capacity and policy reform
- Charles Lewis – Negotiating the Internet in South Africa
- Envir Fraser – Internet governance and the current realities faced by developing countries
- David Mukosa – Interconnection: The Zambian situation
- Lucky Madikiza – Managing scarcity: Taking cognizance of political and economic issues in spectrum and numbering management
- Neema Mori – Financial performance of telecommunications industries: A case study of Tanzania Telecommunications (pty) Ltd. And Zanzibar Telecom Limited
- Wilman Kapenjama – The role of African governments in enabling, regulating and providing ICT-based services: A case study of Tanzania
- Toks Oyedemi – Universal access and universal service: Myth or reality?
- Wanyenda Chilmo – Barriers to universal telecommunications service and their impact on ICT policy and regulation
- Albert Nsengiyumva – Rwanda ICT sector performance

Published papers

- Derek Keats, Maria Beebe, and Gunnar Kullenberg (2003). Using the Internet to enable developing country universities to meet the challenges of globalization through collaborative virtual programmes. First Monday 8(10).
- Derek Keats and Maria Beebe (2004). Addressing Digital Divide Issues in a Partially Online Masters Programme in Africa: The NetTel Experience. ICALT: Joensuu Finland.
- Maria Beebe, Neetha Ravjee, Henry Thairu, and Matthew Mitchell - *Roadmap to Successful Transnational E-Learning* in the proceedings from the WCET 16th Annual Conference (November 2004)

- Maria Beebe – *Managing Trust in Global Initiatives* in the proceedings from the 6th Annual ILA Conference (November 2004)
- Matthew Mitchell – *Leadership in Non-hierarchical Networks* in the proceedings from the 6th Annual ILA Conference (November 2004)
- Lovemore Bingandadi – *Kgotla: Leadership through dialogue* in the proceedings from the 6th Annual ILA Conference (November 2004)
- Derek Keats – *Leveraging Information and Communication Technologies (ICTs) for Strategic Development Goals* in the proceedings from the 6th Annual ILA Conference (November 2004)
- Matthew Mitchell – *Illustrative case study of NetTel*, in Encyclopedia of Developing Regional Communities with Information and Communication Technology, in press (2005); Idea Group Reference: Hershey, PA (ISBN 1-59140-575-0)

Table 7. Areas for improvement: Research component

The research component should consider a small research funds to examine the following research topics:

1. Benchmarking regulatory bodies
    - How were the regulatory authority and its mandate established?
    - What kind of governing body is the regulatory authority?
    - How autonomous is the regulatory authority's decision-making?
    - Does the regulatory authority have enforcement power?
    - How much job security do commissioners and key staff have?
    - Does the regulatory authority have financial autonomy?
    - Does the regulatory authority use transparent decision making processes?
2. Improvements in investments in the sector
3. Improvements in the performance of the sector

ICT applications results

The ICT Applications demonstrate the relationship between telecommunications policy and regulation and key sectors critical to the economic development process, particularly education. The notion is to demonstrate the synergies between ICT/telecommunications policy and other sectors and the implications of ICT/telecommunications policy and regulation on universal access particularly in rural areas.

1. The Knowledge Exchange and Learning Partnerships (KELP) is an organizational system specifically designed to address the need of networking universities from a given region to stimulate active sharing of information, skills, and experience. Through this networking opportunity, five South African universities have been able to experiment and development innovative applications of ICTs to improve the quality of teaching and learning within their institution. A more detailed explanation of the KELP program can be viewed at: http://cbdd.wsu.edu/edev/kelp1.htm.
2. The Kenya Education Network (KENET) is a collaborative initiative by 40-plus colleges, universities, and schools in Kenya to improve the application ICTs to improve the quality of teaching and learning. NetTel is involved with KENET in two ways. First, the pedagogical approaches implemented by NetTel have been applied in KENET through several invitations for trainings. Second, several Kenyan institutions that are part of KENET have joined NetTel as partner organizations. Learn more about KENET at http://www.kenet.org/.
3. KewlNextGen - When UWC began to interact with NetTel it emerged that KEWL could be a useful tool for managing the e-learning delivery, and so UWC became the host institution for the e-learning system of NetTel. As the relationship with NetTel strengthened, UWC was able to add features and enhancements to KEWL in order for it to better support the NetTel programme. Examples of the new features provided in KEWL in response to the unique needs of NetTel include:

    - Active dynamic mirroring of server functions aimed at minimizing the effects of Africa's low bandwidth environment
    - Language selector that currently supports common African languages such as Xhosa, Zulu, Venda, Kiswahili, and Arabic.
    - Static Output feature of the learning management system to facilitate the rapid deployment of CD-ROMs containing the course content for distribution to students in areas that have minimal or non-existent connectivity. The Static Output feature was used to produce the CD containing NetTel's Static Content enclosed in this nomination proposal.
    - Improvements in the discussion forums, allowing for small group discussions supporting each course.

4. Business for Information technology (BIT) (Rwanda) - The BIT Initiative provides learning experiences which will assist students to develop computer technology and business skills. The BIT Initiative is an innovative Applied Technology curriculum that includes upgrading and building computers, hard disk maintenance, trouble-shooting, diagnostic software, MS-DOS, and Windows operating systems. This curriculum empowers students with highly marketable skills and facilitates on-the-job training.

Table 8. Areas for improvement: ICT applications

The key recommendation is for regulators to implement their universal service funds so that creative and innovative ideas on ICTs for development and coming out of Africa could be pilot tested.

Impact: Long-term results

Why policy and regulation in telecommunications?

Prior to the mid 1990s, telecommunications in Africa were primarily state-owned monopolies. They were usually undercapitalized and the penetration of service was very low, while prices for long distance service and highly subsidized local calls were overpriced. In the mid-1990s the terrible performance of state-owned providers combined with internal pressures for political change and restructuring and external pressures from international donors made it necessary to launch telecommunications sector reforms.

Despite the initial reluctance to liberalize telecommunications services, some African countries introduced some important regulatory changes. In general, telecommunications was split from postal services. In some cases, along with the privatization of the state-owned monopoly provider, competition was introduced and an independent regulatory body created. At the same time, many African countries opened the market to cellular entrants. Along with the decrease in the cost of wireless technology and pent-up demand for services, a rapid expansion of mobile subscribers followed. As a result, there were more wireless than wire line subscribers in the region by 2001.

In doing a regression analysis (based on a sample of 14 African countries and 16 Latin American countries), Wallsten (1997:1) suggests positive relationships between (a) "competition — measured by mobile operators not owned by the incumbent" and "increases in the per capita number of main lines, payphones, and connection capacity, and . . . decreases in the price of local calls," and (b) "privatization combined with an independent regulator" and "telecom performance measures." However, privatization by itself is associated with few benefits, and shows a negative relationship with main line penetration (1997:12-13).

While policy is important, additional conditions necessary for regulation to be effective, as noted by Smith and Wellenius (1999:3-4), include broader country governance, strong administrative traditions, and substantial professional cadres capable of handling complex regulatory concepts and processes.

Critical mass of stakeholders

> *To be effective, regulators must have adequate de facto authority including support from key stakeholders.*

These results have contributed to an increase in the number of stakeholders, of which twenty percent are women, able to influence ICT/telecommunications policy or implement telecommunications reforms needed to improve investments in the sector and performance of the sector.

- About 1000 trained in workshops and peering activities[1]
- About 75 lecturers and backup lecturers
- About 150 students enrolled in diploma and degree programs

[1] Some participants may have attended more than 1 event

Changes in ICT/telecommunications policy

Despite only three years of existence, NetTel has contributed to the formulation of ICT/telecommunications policy.

eEducation (South Africa) – The White Paper on eEducation sets out the South African Government's response to a new information and communications technology environment in education. The White Paper will establish the right conditions for ICT in education to flourish in the coming decades. It ensures that every school has access to a wide choice of diverse, high quality communication services. And that all learners and local communities benefit from this investment. The services provided by the initiative will enhance lifelong learning and provide unlimited opportunities for personal growth and development to all. The White Paper represents a new framework for the collaboration of Government and the private sector in the provision of ICT in education. The White Paper became legislation in 2004 and includes language on the eRate. Sawubona from Pretoria! Last Tuesday I attended the national ICT WG of the Dept of Education where we discussed implementation of the EEducation policy which was signed August 2004. Part of the policy explicitly talks about the eRate. In terms of section 45(3) of theTelecommunications Act, 18 January 2005 shall be the date from when public schools and public further education and training institutions will be entitled to a fifty percent discount on: (a) all telecoms calls to an internet service provider and (b) any connection or similar fees or charges levied by an internet service provider for accessing the Internet or transmitting and receiving signals via the Internet or for such access and transmission and reception.

Voice Over IP (Rwanda) - The key issue for regulation is that IP technology and packet transmission of VoIP traffic presents a fundamentally different set of opportunities and challenges than traditional circuit technology. The confluence of IP technology and its complexity, and the financial incentives to use it reflect concomitant regulatory challenges.

Wireless guidelines (TRASA) – The goal of TRASA Guidelines on Wireless Technologies and Regulation is to provide a platform for all 13 southern Africa nations (or as many as are willing to do so) to implement the same or very nearly the same regulatory environment. The reasoning is that the current regulatory environment is keeping costs up and expansion/innovation down.

Improved investments in the sector

> *Investment precedes the deployment of ICTs*
> *And economic growth flows from the deployment of ICTs*
> *And economic growth is what drives and sustains social development.*

Rogers, 2005

In a 2005 discussion paper, the World Bank estimates that during the past decade:

- telecommunications investments in the developing has more than doubled
- a growing share of that investment is private
- investment in telecommunications infrastructure projects with private participation have topped US$210 billion in the developing world over the 1992 to 2002 perio
- Sixty-six developing countries, including 14 countries in sub-Saharan Africa, attracted private telecommunications investment worth more than 5 percent of GDP.

The discussion paper also suggests that continued physical rollout of infrastructure is a result of South-South foreign direct investment flows, domestic financing, reinvested profits, and other sources; not North-South foreign direct investment due to a recent downturn.

Improved delivery of services to the public

With only three years of operations, NetTel's goal remains to assist with making the provision of ICTs and telecommunications services more accessible and more affordable. Here is what the Delft participants imagined IT they would like to have in Africa.

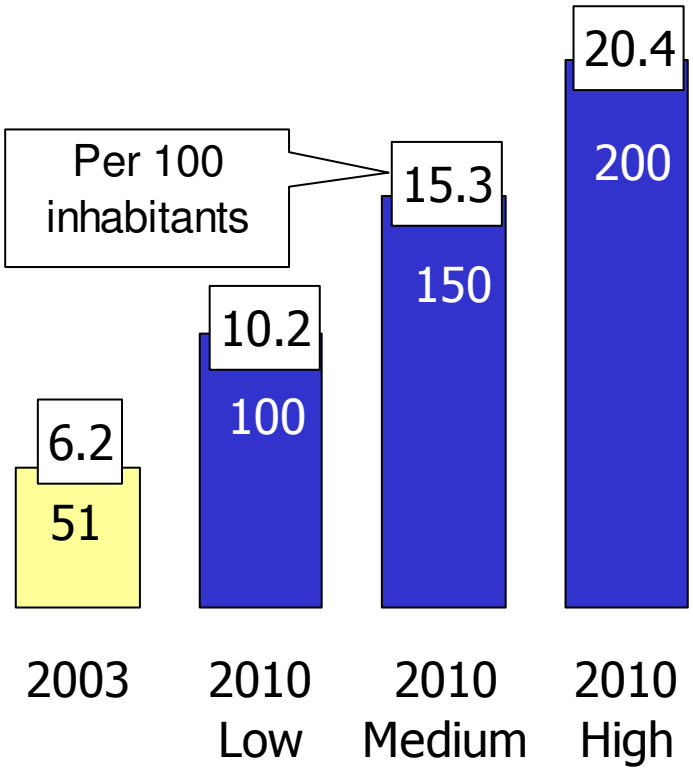
Q 6. Imagine an Africa in which technology exists in service to all people regardless of gender, culture, or disability.

- *What types of technology are employed?*
- *What kind of training and development precedes people's use of the technology?*
- *How is the technology maintained, updated, and enhanced over time?*

1. Key technology types identified include broadband, fiber, satellite, mobiles, wireless (eg. WiFi), laptops, and community technologies (eg. telecentres). Targets like "one phone per village" were identified. Mass media should also not be overlooked; the role of ICTs as knowledge conduits and content platforms was stressed. The importance of standards, interoperability, combination and coordination was also mentioned.
2. Training and development should be done via seminars, university courses, and e-learning. Capacity building should address local design and be powered by local research. Peer learning and bottom-up ("hole in the wall") learning should be encouraged, according to the respondents. Training must also address the issue of computer misuse for banking and other transactions where fraud is a concern. Though initial training can be done outside, it should eventually be done largely locally, so as to ensure sustainability.
3. Technology maintenance should be factored into the contracts at installation time; they should be facilitated by operators, NetTel and diaspora funds. Business support from the private sector should be sought. Attention should be paid to details like design of manuals.

An indication that this vision is not "off the wall" is the ITU forecast for mobile subscribers in Africa under different scenarios (see Figure 3 below).

Figure 3. Forecast for mobile subscribers in Africa under different scenarios. Millions, 2010



Low: annual growth 10%
Medium: annual growth 16%
High: annual growth 21%

Source: Minges (ITU), Africa Telecom 2004

Table 9. Areas for improvement: Impact indicators

There is a growing need to develop "Impact indicators" to measure the impact of ICTs on the Millennium Development Goals (MDGs) in particular and on social and economic development in general; benchmarks to examine the effectiveness of regulators; and indicators by which to evaluate the success or failure of their competition policies. Policy makers, regulators and consumers can use such indicators. A set of indicators allows policy makers to compare the performance of telecommunications operators in other countries or against certain thresholds so that the level of regulation is proportionate to the extent of competition in various telecommunications markets. Regulators can track the effects of regulation imposed on the market and the impact of regulation on consumers. Consumers are able to use information provided by such evaluations to ensure that they get the best possible deals for their money. Along these lines:

NetTel will facilitate the following process:

1. To review studies related to the identification, definition, collection, processing, dissemination and use of telecommunication/ICT indicators;
2. To bring together entities responsible for telecommunication/ICT statistics and analysis, including telecommunication ministries, regulators and operators; academics in order to (a) discuss the results of the studies, (b) assess the relevance of the indicators with regard to policy and regulation in African countries, (c) achieve consensus on key performance indicators, and (d) develop an action plan for data collection and analysis in priority African countries.
3. To do pilot research using the key performance indicators.

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Sustainability

Sustainability of NetTel@Africa requires achievement of the following ***medium to long-term outcomes*** (three years and beyond):

a) Training institutions should have developed the ability and experience to identify and deliver the capacity building needs of ICT policy makers, regulators, and stakeholders as an integral part of their curriculum menu, networking on a bilateral or multi-lateral basis where they consider it critical, so that they offer an internationally competitive product.

b) A peering network should be used by regulators as a basis for multilateral sharing of expertise and experience, and which also supports the development of bilateral peering relationships between regulators.

c) Research funds to stimulate research in ICT and telecommunications to look at the performance of the sector agenda

d) An ICT for development agenda where regulators can implement their universal service funds.

Sustainability requires that members of NetTel@Africa, through formal agreement, accept the need to contribute to the operational funds, and formally bind themselves to such contribution. Such commitment is explicit in the legal instrument establishing NetTel. The contributions approved here as well as the timing have recognised the need to give sufficient notice to regulatory bodies to make provision in their budgets for 2006 or 2006/7 with the target of contributions starting by July 2006: Development partner funding will support key NetTel@Africa activities up to August 2006, by which time partners should have taken on the financing load.

Conclusions

> *Wisdom is like a baobab tree; no one individual can embrace it.*

African proverb

NetTel was motivated to develop this mode out of necessity, due to the limited lack of expertise in many of the institutions. Like many steps in evolution, what is conceived out of the necessity to grow and survive provides a more resilient organism.

> *One who enters a forest does not listen to the breaking of the twigs in the brush.*

African proverb

A lesson learned is that partner institutions embarking upon the NetTel journey should not begin to fear or look for the slightest obstacles in their endeavors. One key to achievement is a need for institutions to remain focused on the task despite not knowing exactly how to get there. The declaration of partnership produced a commitment to produce something that the partner institutions did not have the faintest idea of how they will go about achieving. Nevertheless, a commitment to build a future that represents a breakthrough from the past was made. Led by African academics, U.S. and African universities (and later universities from other regions) collaborated in developing courses with the engagement of practitioners. These courses were pilot tested during the Safaris and peer reviewed. Development of content on ICT policy and regulation was done in concert with the development of a suitable technology platform, Knowledge Environment for Web-based Learning (KEWL).

> *I pointed out to you the stars (the moon) and all you saw was the tip of my finger.*

African proverb

For the NetTel partner institutions who attended the safaris (aka telejamboree, rally, adventure), they have gone beyond the tip of their finger to pointing at outcomes, purposes and goals of ICT policy, regulation and applications. The safaris have demonstrated why learning about ICT policy, regulation and applications is relevant not just for policy makers and regulators but also for operators, consumers and academics. To some extent, the completion of the Post Graduate Program Catalogue which is an articulation of agreements reached or, in another sense, an outcome of deliberations has helped move the network onward and forward to its stars. For example, the workshop for judges and legislators has highlighted the importance of Africa to Africa to U.S. peer to peer relationships. These strategic conversations between peers -- commissioner to commissioner, judge to judge, and lawyer to lawyer – demonstrate learning from each other, whether from Nigeria or from Oregon or from DC. As peers they see mutual benefit in discussing global problems and finding solutions that better fit their local situation. In the community to community ICT applications, exploiting synergies between policies in ICT/telecommunications and sector specific policies (as in eEducation) and building bridges between ICT policies and application (as in eRate) are leverage points or areas of influence that can lead to lasting beneficial changes.