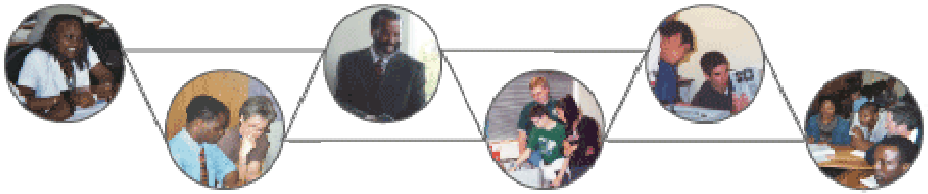
# *Network for Capacity Building and Knowledge Exchange in the Telecommunications Sector (NetTel@Africa)*

CBDD



We Help People, Communities and Institutions Apply Information Technologies

## Sixth Quarterly Progress Report to Internews Network
## 1 September 2003 to 30 November 2003

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# *Network for Capacity Building and Knowledge Exchange in the Telecommunications Sector (NetTel@Africa)*

## *I. INTRODUCTION*

This Sixth Quarterly Report (1 September 2003 – 30 November 2003) provides an update of the four NetTel@Africa project components: Training Program in ICT and telecommunications policy and regulation; Peer-to-Peer Exchanges; Community-to-Community Network; and Research on how ICT policies impact other sectors. Also provided in this report are summative descriptions of Sixth Quarter accomplishments and discussion of specific issues to be handled in the near future.

Significant progress has been made in Training Program and Peer-to-Peer exchanges during the Sixth Quarter. Specific NetTel activities highlighted in this report include the Telejamboree in Abuja, Nigeria, the Judges and Legislators Workshop also held in Abuja, and the NetTel Safari@the Equator. These three activities provided unique opportunities to sharpen the Post Graduate Diploma (PGD) Training Program curriculum and to build valuable Peer exchanges among ICT policy makers and regulators from West and East Africa.

**Box 1. NetTel@Africa 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; training for faculty members and their teams on the use of the Knowledge Environment for Web-based Learning (KEWL); and development of academic programs in telecommunications at the graduate diploma and masters' levels.

The **Peer-to-Peer (P2P)** exchanges 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 in Africa and the U.S.)

The **Community-to Community (C2C) ICT Application** networks demonstrate the relationship between telecommunications policy and regulations with key sectors critical to the economic development process, particularly education. The C2C networks will help policy makers and regulators understand the concrete ICT applications and implications of legislation on universal access policies and funds.

The **Research Program** focuses on monitoring and evaluating the progress of the Training Program and also provides a mechanism for collecting and analyzing new content that will feed the various courses that compose the Training Program.

# *II. PROGRESS ON PROJECT COMPONENTS*

## 1. Training Program in Telecommunications Policy and Regulation

### A. Summary of Sixth Quarter Accomplishments (1 Sept. - 30 Nov. 2003)

#### *i. Course Development*

[September] The course developers met at UNISA from 31 August to 5 September 2003 to finalize roll-out plans of the Post Graduate Diploma Training Program in ICT policy and regulation.

Upon conclusion of the meeting, course developers were able to:

- Articulate the relevance of their courses to ICT policy and regulation
- Better formulate learning outcomes at the postgraduate degree diploma and masters degree level
- Construct learning tasks/activities that are linked to their learning outcomes
- Analyze the link between their choice of learning assessments and their desired learning outcomes and learning tasks/activities.
- Appraise the options for e-Learning delivery (mix of face-to-face and online delivery.)
- Decide on terms to be included in a reciprocity agreement among African institutions.

Course developers included Marcia Wilson from University of South Africa (UNISA) who also hosted the work session, Toks Oyedemi from University of Fort Hare, Joseph Chuma from University of Botswana, Marcellina Chijoriga from University of Dar es Salaam, David Mukosa from University of Zambia, Andy Bytheway from University of Western Cape, Charles Lewis from University of Witswatersrand, FF Tusubira from Makerere University and Angelus Ruitanurwa from AFRALTI.

Hashim Twaakyondo, NetTel@Africa African Academic coordinator and Maria Beebe, Overall NetTel@Africa coordinator facilitated the work sessions.

Content experts who participated in the work session included Dale Hatfield from the University of Colorado who also reported on the gap and overlap analysis (see attached document), Bill Gillis from Washington State University and Brian Goulden from the Internews Network.

e-Learning expertise was provided by Bob Spear from University of Maryland and Kevin Hayes, USAID EGAT Program Advisor on IT and Higher Education.

Richard Mwanza, TRASA Programme Manager and the 2 Human Resources co-conveners (Gwen from ICASA and Erasmo from Tanzania Communications Commission) participated in the work session.

Cedric Muleya from University of Western Cape provided assistance on KEWL.

Lovemore Bingandadi attended the work sessions.

Participants made several important decisions regarding the Training Program and implemented a rigorous timetable in preparation for course roll-out. Listed below are the pertinent decisions reached, as well as an outline of the timetable.

Decisions made:

- See draft MoU [see Attachment A]
- Mutual recognition of credits
- Course instructors subject to recognition by partner institutions.
- Course fees will follow each of the university's existing fee structure.
- Assessment at a minimum will consist of (a) not more than 50% final examination and (b) up to 50% continuous assessment to include a variety of learning activities around group work, individual work, and participation in online discussion fora.
- Each university will provide x number to scholarships (x to be determined later)

[September] Request for information about taking ICT policy and regulation courses are starting to come from NGOs (e.g. Bridges.org), African universities (Nigerian Universities), and from Europe. While email responses have been sent, there is a need to develop a database to ensure follow-up actions.

[September] Planning began for Billy Jack Gregg, Consumer Advocate from West Virginia, to make a Hot Topic presentation at the NetTel Telejamboree, in Abuja, Nigeria.

[September] e-Learning module, as part of the course on ICT applications (TR510), is underway. This is a contribution by the WSU-CBDD to course development.

[September] Bill Gillis visited University of Fort Hare after the course development work session. Washington State University will serve as the U.S. university partner for the University of Fort Hare.

[September - October] KEWL training for Makerere University was concluded by a team from UWC.

[September] Invitation letters were drafted and sent out by the Nigeria Communications Commission (NCC) to resource speakers for the NetTel Pilot Test for WATRA (Nov 3-8, 2003). Email discussions continued with NCC on logistics and substance of the Telejamboree program. Email discussions also continued with resource speakers regarding substance of their hot topics and logistics.

[September - October] Schedule of activities for the WATRA NetTel Safari were modified and refined by the NCC. Corresponding arrangements were confirmed with participants from the US Regulatory community.

[October] While in DC (Oct 1-3), Maria met with Leland and USAID/Nigeria with regard to assistance in the telecommunications sector for Nigeria. Given that the focus in Nigeria is rural access, Brian Mitchell from NTCA will act as the policy advisor to NCC. Maria will act as overall program coordinator while focusing on helping NCC build capacity and knowledge exchange networks through the Nigerian Telecoms Institute.

[October] The discussion forum established by the CBDD was expanded to include a forum for general NetTel issues.

[October] Maria Beebe traveled to South Africa to discuss with KEWL developers preparations for an upgrade to the next generation of KEWL in December. This process will include the creation of new filters and processes designed to make the users' experience more intuitive.

[October] Continued work was done on the NetTel@Africa Pilot for WATRA in Abuja, Nigeria (Nov 3-8, 2003) and NetTel@theEquator pilot for ARICEA hosted by Uganda Communications Commission in Kampala, Uganda (Nov 21-28, 2003). Much work was done to finalize travel details for contingent of experts from the US regulatory community to visit Nigeria and Uganda. These NetTel activities served the dual function of sharpening the content of the curriculum and expanding the NetTel Peer-to-Peer Network. Content from these activities will provide "springboards" for the discussion of hot topics and contemporary issues in telecommunications.

[October] Correspondence with course developers continued as the quality assessment process coalesced with the completion of course development. The quality assessment process is serving as significant motivator for course developers to finish their work.

[October] During a brief pass through South Africa, Maria Beebe (a) debriefed the USAID/South Africa mission director (Dirk Dijkerman) and Mathata Madibane regarding the eEducation policy and possible next steps for its implementation by the Department of Education; (b) met with Dr Hans J Boon, one of the Southern African Network for Educational Technology and eLearning (SANTEC) board members who is also Director of the Telematic Learning and Education Innovation at the University of Pretoria about common interests, particularly online courses that could be shared with African partner institutions; (c) met with Marcia Wilson at the University of Pretoria regarding the two modules being prepared by UNISA; (d) coordinated with ICASA and USAID/South Africa to prepare for the visit of Commissioner Copps to Abuja, Nigeria Nov 19-20, 2003; (e) met with Peter Franks from the University of the North about progress of their KELP Management Sciences Network; he indicated he could use a workshop on eLearning in January 2004; and (f) discussed with Dr Tusubira (Project Lead for CATIA 1(e); Policy and Regulation how best to ensure that the DFID CATIA 1(e) effort is in synch with NetTel@Africa.

[November] A draft version of a course catalog for the PGD Training Programme has been developed and distributed to the NetTel Coordination team. [See Attachment B]

[November] A draft version of the registration process for enrolling in NetTel courses was developed and posted on the NetTel web site for input from the NetTel course developers.

[November] While in Nairobi (Nov 20-21) Maria Beebe met with AFRALTI (Ed Mallango and Angelus Ruitanurwa) and ITU's regional representative Mike Nxele to discuss steps to improve the course on service pricing. Back at CBDD, follow-up with Dr. Horrall (University of Pittsburg) was conducted to coordinate a plan to strengthen the curriculum of TR508 (Service Pricing).

[November] Also while in Nairobi, Maria Beebe met with George Mbate (USAID), Victor Kyalo (KENET) and Henry Thairu (KENET) to discuss content development for KENET, erate, and documenting the story of KENET.

[November] A profile of NetTel's instructional team was assembled; missing data was requested from relevant parties.

[November] A discussion forum on the KEWL site was begun to collect ideas that will eventually be organized as an FAQ that is tentatively called "KEWL for busy people". This resource is intended to help both instructors and students using KEWL for the NetTel programme.

### *ii. Geographic Expansion*

[October] While in Washington D.C., Maria met with Leland, USAID, NTCA and World Bank with regard to the telecommunications sector in Ethiopia. Ethiopia and Nigeria to become part of the GDA on Rural Telecoms Access.

### *iii. Quality Assurance Reviews*

[September] Analytical work on the gaps and overlaps in the NetTel curriculum were undertaken by the University of Colorado. The submission of an overall review of the Training Program, by Dale Hatfield, responds to the changing content in the curriculum. [See Attachment C]

[September] Dr. Bob Spear (University of Maryland) visited four of the African institutions for hands-on assistance to get their courses ready for eLearning. He ensured that learning outcomes, activities and assessment are explicit and aligned to each other. He also helped to make their content more interesting with graphics, audio and video.

[September – October] A summary email was distributed to each course development team stating the next steps in the quality assessment process that contained a compilation of all previous review reports and a copy of the newly adopted assessment rubric for eLearning design. The rubric focuses the following four aspects of each NetTel@Africa course: [see Attachment D]

- Learner Support and Resources
- Online Organisation and Design
- Instructional Design and Delivery
- Assessment and Evaluation of Student Learning

Specific topics within each area will be evaluated using a four-point scale:

- Lacking – A given topic is not positively addressed. Development is needed.
- Baseline – The quality of a given topic is positive but does not meet expectations, considerable improvement is needed.
- Effective – The quality of a given topic meets expectations, however some improvement is needed.
- Exemplary – The quality of a given topic exceeds expectations.

[October] A quality assessment rubric for content was developed. Scope of topics covered includes (see Attachment E):

- Appropriateness of depth and academic rigor

- Inclusion of interdisciplinary design
- Adherence to academic integrity

[October] Review team from CBDD moved ahead with the first round of assessments focusing on general content and design in October. Mark Jamison and Dale Hatfield helped with the second round of assessments focusing on content in November.

[October] The CBDD discussion board was dramatically expanded to enable a password-protected forum for exchanging constructive feedback. The participant group is limited to course developers and members of the QAR Team (Hatfield, Gillis, Jamison, Twaakyondo, Mutagahywa, Tusubira, Beebe, and Mitchell).

[November] An archive of previous Quality Assurance Review reports has been posted on the Internet and is password protected, accessible to course developers and key supporters.

[November] The CBDD debriefed Dr. Bob Spear's trip to several NetTel Partners to help identify opportunities to improve the eLearning aspect of the NetTel Training Programme.

### *iv. NetTel@Africa Informational Web-site*

[September - October] Significant reorganization of content on NetTel's Informational web site was made. Notably, the document archives for NetTel were reworked and updated. (http://www.nettelafrica.org)

[September – October] Descriptions of the ten basic level courses (TR 501 to TR 510) were completed and posted on NetTel's informational site. These pages are located in the navigation tree under: Components>>Training Program>>Post-Graduate. Text and design ideas built on NetTel summaries developed by Internews' Kellie Klien.

### *v. NetTel@Africa Telejamboree (November 3-8 2003)*

The NetTel@Africa Telejamboree for West African Telecommunications Regulators (WATRA) was hosted by the Nigerian Communications Commission (NCC) on 3-8 November 2003. The Executive Vice-Chairman Ernest Ndukwe underscored the need "to keep pace with the human resource requirements of the fledgling industry." He then introduced the objectives of the NetTel Safari and Workshop as follows: to introduce WATRA members and other Nigerian stakeholders to the courses which have been developed for postgraduate diploma and Masters programme in ICT Policy and Regulation; to hold discussions on some Hot Topics in the Telecommunications sector in order to acquaint participants with various challenges that are currently being faced by the telecoms industry worldwide; and to help determine the adaptability of the courses already developed to the West African context.

Highlighting the importance of the telecommunications sector as an enhancer of economic growth the USAID/Nigeria Mission Director announced funding a total of $845,000 to further facilitate the goal of "Strengthened Access to Telecommunications in Nigeria" as a demonstration of confidence in the NCC's role in leading the telecommunications transformation. In addition to USAID, support for the event was provided by CTO, MTN, Econet, ITN, Linkserve, Intercellular, and Teledom.

About 100 participants consisting of regulators and operators from Benin, Cote d'Ivoire, Gambia, Ghana, Guinea-Bissau, Mali, Nigeria and the U.S.participated in the telejamboree as

well as academics from four Nigerian universities (see Attachment F). Resource speakers included NetTel@Africa partners from Makerere University (F.F. Tusubira), the University of Fort Hare (Toks Oyedemi), South Africa (Marcia Wilson was represented by Mark Jamison), Western Cape (Andy Bytheway), Witswatersrand (Charles Lewis), and Zambia (David Mukosa) and from University of Florida (Mark Jamison), Maryland (Tim Wedig) and Washington State University (Maria Beebe). Billy Jack Gregg from the Consumer Advocate's Offfice in West Virginia and Shola Taylor from Kemilinks International in the U.K. as well as representing CTO gave hot topic workshops. Manny Abonieham (George Washington University) also President of the Nigerial IT Professionals in the Americas (NITPA), Vesper Owei (George Washington University), and Bolaje Aluko (Howard University) represented the Nigerian diaspora.

In the process of reviewing the NetTel@Africa courses, the participants also had the opportunity to use technology in new ways (thanks to a 10mbps connection provided by Linkserve and a computer laboratory set-up by NCC at the conference venue). The participants indicated they learned to:

- Navigate http://www.nettelafrica.org (get information about the network)
- Use search engines to look for resource materials
- Navigate http://elearn.nettelafrica.org (KEWL – elearning management system)
- Use online discussion forum
- Scratch the surface with regard to using technology for teaching and learning

### *vi. Workshop for Judges and Legislators (17 – 21 November 2003)*

The Nigerian Communications Commission hosted a workshop for judges and legislators on legal issues in telecommunications on Nov 17-19 (see Attachment G). About 12 legislators from the National Assembly , 45 judges, 8 private sector lawyers and 18 interested parties participated in the event (see Attachment H). FCC Commissioner Copps delivered a paper on the international regulatory environment. His legal advisor, Paul Margie did presentations on Spectrum Management and Convergence. Tom Barkin, an administrative law judge at the Oregon PUC did a presentation on the state of telecommunications and led a panel discussion on competition issues in telecommunications. Tom also did a half day session on Nov 19 on enforcement of regulatory direction and case study on enforcement action, checks and balances in the regulatory process, and judicial review of administrative action in telecommunications regulation.

### *vii. NetTel Safari@theEquator (22 – 28 November 2003)*

The NetTel Safari@the Equator for the Association of Regulators of Information and Coomunication in East Africa (ARICEA) was hosted by the Uganda Communications Commission (UCC) and Makerere University on 22-28 November 2003. In addition to USAID's Leland Initiative, support for the event was provided by CTO, UTL and MTN.

About 55 participants consisting of regulators and operators from Cote d'Ivorie, Benin, Botswana, Ethiopia, Kenya, Malawi, Namibia, Rwanda, Sudan, Uganda, Zambia, Zimbabwe, U.K. and U.S. participated in the Safari@theEquator as well as academics from Makerere University, Nairobi University, National University of Rwanda, University of Lagos, University of Namibia, and University of Khartoum (see Attachment I).

Resource speakers included NetTel@Africa partners from Makerere University (F.F. Tusubira), South Africa (Marcia Wilson was represented by Nanette Thompson), Western Cape (Andy Bytheway), Witswatersrand (Charles Lewis), and Zambia (David Mukosa) and from University Maryland (Tim Wedig and John Wilkenfeld) and Washington State University (Maria Beebe). Commissioner Nanette Thompson from Alaska PUC, Commissioner Jo Anne Sanford from North Carolina PUC, Shola Taylor from Kemilinks International in the U.K. also representing CTO, Brian Goulden (SIPRS), Liz Nightingale (an independent consultant with FCC experience), Patrice Aliakai (MTN) and from Uganda Telecoms gave hot topic workshops.

### B. Future Actions for the Training Program

- Establish peer review panels
- Peer review courses
- Establish common calendar
- Finalize publicity materials
- Register first cohort

## 2. Peer-to-Peer (P2P) Exchanges and Network

### A. Summary of Sixth Quarter Accomplishments (1 Sept. - 30 Nov. 2003)

#### *i. P-2-P Networking Solution*

[September] Planning began for Commissioner Copps of the FCC to participate in the training of legislators, lawyers, and judges at a NetTel sponsored workshop to be held in Abuja, Nigeria (Nov. 17-18). In addition, Tom Barkin, Administrative judge from Oregon State PUC was invited by the Nigerian Communications Commission to act as resource person.

[September] In response to a request by African colleagues at TRASA to develop an on-line discussion forum to facilitate discussion among regulators internationally with shared interests in telecom and ICT, the following discussion forum has been started by the Center to Bridge the Digital Divide: http://cbdd8721.cahe.wsu.edu. Use of the Discussion Board as a communication tool has been implemented by US and African Regulators.

[October] A forum in French was begun for some of WATRA's francophone countries. A note urging the NetTel community to participate in this forum was distributed.

[October] A lively and constructive discussion about the best practices in setting up electronic communities of practice was initiated by Derek Keats. This discussion was prompted by the introduction of new discussion forum that is hosted outside of South Africa. At issue are two questions: a) What are the principles of electronic communities of practices? and b) How does a capacity building program like NetTel balance effective and proactive implementation with real empowerment of target populations? This discussion is on-going.

#### *ii. African Partners and U.S. Peers*

[November] Maria Beebe coordinated the planning of the Workshop for Judges and Legislators scheduled on November 17-21, 2003. Commissioner Copps and his legal advisor to attend as well as Tom Barkin, an administrative law judge from Oregon PUC.

[November] FCC Commissioner Copps and Paul Margie proceeded to South Africa on Nov 19-21 where they met with the following stakeholders: ICASA Chairman Mandla Langa, CEO Mr. Nkateko Nyoka, Councilor Mr. Lumko Mtimde, Councillor Mr. Gerhard Petrick; Advisor to the Chairperson Michael Markovitz; Nexus Connection SNO empowerment partner—Jim Myers; Dept. of Communications Deputy Director General of Telecommunications – Mr Pakamile Pongwana on Convergence legislation; and participants of a TRASA event hosted at the University of Witswatersrand. They also toured the Telcom National Network Operating Center.

### B. Future Actions for Peer-to-Peer Exchanges and Network

During the 2004 calendar year an effort will be made to keep members from the US and African regulatory communities engaged in joint knowledge exchanges and capacity building activities. Fiscal resources and plans regarding venues and topics for collaboration will be explored by the CBDD. One option to accomplish this goal is to pursue research funding that is aimed at helping international peers of the regulatory community understand more precisely the connection between regulation and access to ICT for socio-economic development.

## 3. Community-to-Community ICT Applications Networks

### A. Summary of Sixth Quarter Accomplishments (1 Sept. - 30 Nov. 2003)

[September] The South Africa e-Education policy document has been posted for public comments through the end of December 2003 and then it becomes legislation

[September] WSU hosted 8 South Africans from the University of Witswatersrand, the Gauteng Provincial Department of Education, and several NGOs. The contingent visited Microsoft, Puget Sound Center for Teaching and Learning, High Tech High Schools, Mt Spokane High School, Mead Middle School, WSU College of Education, Regal Elementary and Rogers High School.

[October] Maria Beebe was honored with an invitation to participate in the 10th year anniversary of the School of Public and Management Administration (SPMA) at the University of Pretoria (Oct 20 and 21). Maria read a paper on Knowledge Exchange and Learning Partnerships (KELP) as part of a colloquium on "Africanising Public Administration: Issues for Leadership and Governance." Awards for ICT innovators for teaching and learning were also presented.

[November] Alison Olzendam from WSU-CBDD visited the University of Witwatersrand (WITS) and the University of Cape Town (UCT) regarding future plans to expand the Network for Teaching, Learning and Technology. Current participants of this network include WSU and WITS. It is expected that UCT will join.

### B. Future Actions for the Community-to-Community Networks

- Locate funding for the 4-H Today's Teens Teaching Technology.
- Schedule eLearning workshops with KELP partners.

# 4. Research Component

## A. Summary of Sixth Quarter Accomplishments (1 Sept. - 30 Nov. 2003)

### *i. New Telecommunications Research Ventures*

[September] Plans for documenting the NetTel@Africa story as a book have been initiated.

### *ii. AfricaDotEdu*

[September] Distribution agreement signed with Washington State University to sell AfricaDotEdu

[October] The AfricaDotEdu e-commerce site was launched and has already logged sales to the US, Europe, and Africa (http://wsupress.wsu.edu/shop/shopsearch.asp). The promotional web site for the book (http://africadotedu.org) has been updated.

### *iii. Funding Opportunities*

[October] A significant effort was made in preparing a grant proposal for the NIH program called Informatics Training for Global Health. The proposal is a joint effort by two units at WSU (CBDD and the Intercollegiate Nursing College), the International Institute for Insect Physiology and Ecology (ICIPE) in Kenya, and a group of bioinformatics consultants from the School of Medicine at the University of Miami. If successful, this program will add many research and networking opportunities and training benefits to the e-applications aspect of NetTel.

## B. Future Actions for the Research Component

### *i. Technological Solutions*

[October] Matthew Mitchell visited with a Portland-based IP-based Video hosting firm concerning a video-communication solution for NetTel@Africa to be used for meeting, teaching, and assessment. Matthew also investigated the use of Polycom's ViaVideo camera system. This technology appears to be compatible with the bandwidth available at some of NetTel's partner institutions in Africa. This option is being considered as a key solution for future NetTel management objectives.

### *ii. Research Initiatives*

- Bill Gillis and Matthew Mitchell to explore possibilities for the development of an ethnographic study of a dimension of telecommunications regulation with Robert Textor (Stanford professor emeritus).
- Maria, Matthew and Bill to prepare three NSF research proposals that will be submitted during the 7th Reporting Quarter.
- Maria and Madanmohan Rao to finalize request for papers for a new book on AfricaDotGov: ICT, Public Policy and e-Government.

# *III. WSU MANAGEMENT/UDSM COORDINATION*

## A. Sixth Quarter Accomplishments (1 Sept - 30 Nov 2003)

[September] A next to final draft of the prospectus was submitted by Hashim Twaakyondo. This document was rolled into the PDG Training Programme Catalogue.

[October] Maria and Matthew conducted extensive dialog with Dr. Twaakyondo concerning the roles and responsibilities of the NetTel Coordination Team. It was agreed that the management of the NetTel Informational site will be completely assumed by the Coordination Team by January 2004. Also discussed was the status of the Experts Database of ICT Regulators.

[October – November] Maria and Matthew conferenced with Dr. Keats concerning the technology plan for NetTel@Africa. A strategy for building an e-Learning resource that will serve NetTel is being brainstormed.

## B. Future Actions for WSU Management & UDSM Coordination

- Transference of oversight responsibilities from WSU-CBDD to UDSM will be a priority of the 7th Quarter. Specific duties will include NetTel communication systems (email, discussion forum, web site), resolution of academic issues for the roll-out of the PGD and Masters Degree Training Programs, and planning and implementation of future NetTel Safaris.
- Harmonize oversight responsibilities with Dr. F. F. Tusubira, project lead for the CATIA funded component of NeTTel.
- Reconcile accruals with mid-point expenditures of subagreements. This may require revisiting subagreement budgets.

# *IV. PROJECT DIRECTOR FINAL NOTES*

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

Sometimes people can focus only at the tip of their finger rather than where it points -- the stars. For those 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.

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. Undoubtedly, there is still much work to be done but with so many committed individuals from so many organizations from so many countries how can we not succeed?

# *Attachment A: MoU*

THIS MEMORANDUM OF UNDERSTANDING (hereinafter referred to as MoU) for a Network for Capacity Building and Knowledge Exchange in the Telecommunications Sector (hereinafter referred to as NetTel@Africa) is made:

*Between*

University of Botswana (UB)
and
University of Dar es Salaam (UDSM)
and
University of Fort Hare (UFH)
and
University of South Africa (UNISA)
and
University of Western Cape (UWC)
and
University of Witswatersrand (WITS)
and
University of Zambia (UNZA)
and
Makerere University
and
The African Advanced Level Telecommunications Institute (hereinafter referred to as AFRALTI)

WHEREAS

- Following the Botswana meeting held in April, 2002 the Parties hereto signed a Declaration of Partnership to facilitate the cooperation between and among the parties regarding the NetTel@Africa Capacity Building Programme.
- The parties are desirous of entering into an Understanding to facilitate and regulate such cooperation.

NOW THEREFORE it is understood as follows:

## CLAUSE 1

## INTERPRETATION

1.1 In this MoU unless the context otherwise requires:

(a) "Curricular resources" includes teaching materials on Knowledge Environment for Web-based Learning (KEWL), electronic readings available in the public domain and lecture notes;

(b) "Home institution" means that institution where a student registers and pays fees;

(c) "NetTel@Africa Partner Institutions" means the parties who are signatory to this MoU

1.2 Wherever appropriate, references in this MoU to the masculine gender shall be construed to include the feminine and vice versa, the singular to include the plural and vice versa.

## CLAUSE 2

## THE NETTEL@AFRICA POSTGRADUATE DIPLOMA AND DEGREE PROGRAMME IN ICT POLICY AND REGULATION

2.1 Effective from January, 2004 a Partner Institution may offer the NetTel@Africa Postgraduate Diploma and Degree Programme in ICT Policy and Regulation.

2.2 The Programme shall:

(a) Have its general curriculum available on the Internet at http://elearn.nettelafrica.org;

(b) Incorporate a mix of online learning resources and supplementary instructional materials supported by face to face interaction;

(c) Have its curricular resources available as open content for not-for-profit education and training purposes;

(d) Have its curriculum processed so as to satisfy requirements set by the regulations of each Partner Institution;

(e) Have its curriculum reviewed regularly, provided that such review takes place after every three (3) years.

## CLAUSE 3

## ADMISSION OF STUDENTS

3.1 Each Partner Institution shall admit students to the Programme according to the rules and regulations stipulated in the home institution. Provided that the minimum qualification for admission to the NetTel@Africa programme shall be a Bachelor's Degree or equivalent.

3.2 All students will register for NetTel@Africa courses at their home institution and will receive their degree or other awards from their home institution.

3.3 Students registered for the NetTel@Africa programme shall be subject to the rules and regulations of the home institution.

3.4 NetTel@Africa shall endeavour to ensure that women are admitted to the programme.

## CLAUSE 4

## RECOGNITION AND TRANSFER OF CREDITS

Subject to the governing regulations of each institution

(a) All Partner institutions shall recognise each other's credits.

(b) a student may transfer from a home institution to another Partner institution.

(c) In the event a student decides to transfer from one institution to another Partner institution offering the NetTel@Africa programme, he shall transfer with all his NetTel@Africa credits. Provided that a student shall have to satisfy additional requirements, if any, for degree completion imposed by the new Partner Institution.

## CLAUSE 5

## ASSESSMENT OF STUDENTS

5.1 Assessment of students shall be apportioned as follows:

(a) a maximum of fifty per centum (50%) for examination or examination equivalent;

(b) not less than fifty per centum (50%) of continuous assessment based on learning activities.

5.2 Continuous assessment shall include assessment for group assignment, individual work and participation in online discussion.

## CLAUSE 6

## THE NETTEL@AFRICA POSTGRADUATE DIPLOMA AND MASTERS DEGREE

6.1 Each NetTel@Africa Partner Institution may register Postgraduate Diploma and Masters Degree students.

6.2 Each Partner Institution will assist in identifying research topics for and supervisors of the Master's Degree students in any Partner Institution.

6.3 A supervisor who is identified, appointed and hired for the Master's Degree programmed shall be an adjunct faculty to the home institution.

## CLAUSE 7

## QUALIFICATIONS OF INSTRUCTORS

All persons who teach in the NetTel@Africa Postgraduate Diploma and Degree Programme in ICT Policy and Regulation at all institutions will have a minimum of a Masters Degree. Relevant industry experience in ICT and telecommunications regulation will be an added advantage.

## CLAUSE 8

## COORDINATION

8.1 Each Partner Institution will nominate a person to be responsible for contacts between the Net@Africa programme at the home institution and other NetTel@Africa Partner Institutions. Such person shall be referred to as NetTel coordinator.

8.2 A NetTel coordinator will lease with the NetTel@Africa academic coordinator for harmonization of the entire process of facilitation and allocation of expertise from various institutions.

8.3 Each NetTel coordinator will have the following responsibilities:

(a) to act as the learning facilitator for the course for all Partner Institutions;

(b) to take care, of students of the home institution, by ensuring inter alia, that they receive and do all courses;

(c) to arrange for local learning facilitators in respect of each of the other courses; the learning facilitators will provide human interaction required for effective education and help build local teaching capacity in the home institutions that lack adequate human resources to teach certain NetTel@Africa courses.

8.4 NetTel@Africa coordinators shall meet regularly for the purposes of, among other things:

(a) monitoring the status of the programme;

(b) monitoring the successes and failures of the programme;

(c) considering curriculum review;

(d) considering expansion of degree and course offerings;

(e) any other matters of mutual interest.

## CLAUSE 9

## DURATION, WITHDRAWAL AND MODIFICATION

9.1 This MOU shall take effect from 2003/04 academic year and be valid for a period of three years with an option to renew.

9.2 During the second year NetTel@Africa Partner Institutions may consider renewal of this MOU for an additional three year period.

9.3 Any NetTel@Africa Partner Institution may withdraw from the NetTel@Africa, by notice in writing prior to withdrawal, of not less than 12 months addressed to all other Partner Institutions. Provided that any students at the terminating institution who commenced the NetTel@Africa postgraduate diploma and degree programme in ICT policy and regulation shall not be prejudiced.

9.4 This MOU may be modified by mutual consent of Partner Institutions.

## CLAUSE 10

## GOVERNANCE

10.1 There shall be a governing board of the programme

10.2 Every Dean (or equivalent) of a Faculty (or equivalent) where the NetTel programme is being hosted shall be a member of the governing board of the programme.

10.3 Members of the board shall elect one of their member to be chairperson of the board.

10.4 The duties of the Board shall include:

a) to be responsible for all processes required by universities to confess the postgraduate diploma or degree as the case may be;

b) to ensues that the programme is run smoothly in all partner institutions;

c) to help solve problems, if any, in the running of the programme by any partner institution.

d) To liaise with the University organs and ensure that the programme is run according to university regulations

## CLAUSE 11

## QUALITY ASSURANCE

The Senate (or equivalent) of each institution shall be responsible for the quality assurance of that programme which is hosted by a Faculty of that Institution.

## CLAUSE 12

## DISPUTE RESOLUTION

The parties to this MOU shall use their best efforts to settle amicably all disputes arising out of or in connection with this MOU as its interpretation.

## CLAUSE 13

## COPYRIGHT

13.1 Each institution which has developed materials shall have a copyright over such materials.

13.2 Notwithstanding the provisions of clause 13.1 all other partner institutions shall be allowed to freely make use of the materials.

## *Attachment B: Post Graduate Diploma Program Catalogue (see separate attachment)*

# *Attachment C: Dale Hatfield's Report*

Dear Maria,

As you know, my colleague, Courtney Cowgill, and I have been conducting a review of the course material produced in conjunction with NetTel@Africa. I am very sorry that I was unable to attend the NetTel Safari meeting in Botswana in May, but the review that Courtney and I have conducted has helped me "catch up" as the case may be. Courtney and I have focused most of our attention on three areas:

*First*, a major focus of our review has been in terms of what we refer to as the "gap and overlap" analysis. The purpose of this portion of the review was to systematically identify (1) important material that may not be covered in any of the ten courses (the "gap" analysis) and (2) material that appears to be covered in more than one course in a way that seems unnecessarily duplicative or inconsistent (the "overlap" analysis).

*Second*, we have attempted to evaluate the overall academic level of the course material as it currently exists. Clearly, the overall academic level is important for a number of reasons. It is important in ensuring that the academic institutions involved contribute in a maximal way toward strengthening the African policy making and regulatory bodies involved in the ICT sector. It is also important to facilitating the seamless movement of students among the African institutions and, hopefully in the longer term, between African institutions and counterpart institutions of higher education in the United States and elsewhere.

*Third*, because of my over 25 years of experience in telecommunications policy and regulation as both a teacher and practitioner, I have attempted to identify additional materials – and sources of materials – that may be useful to course developers. We have tried to include references to such materials where appropriate.

The balance of this letter report is divided into three sections. Section I contains my general comments on the complete package of courses, including comments on the overall academic level of the courses as described above. Section II, contains the "gap and overlap" analysis I described earlier. Since this analysis is carried out on a course-by-course basis, for convenience, I also include specific recommendations for additional materials or sources of materials. Section III contains a brief summary and statement of our conclusions.

**Section I – General Comments**

Having completed a rather complete review of all of the course material prepared in advance of the meeting in Botswana and having benefited by the comments on the content that were made by participants at that meeting, we are generally quite pleased with the scope or breadth of the material presented. That is, other than for some specific exceptions that are identified in conjunction with our comments on individual courses, we find that suitable material is presented on all the major areas with which a modern policy-maker or regulator should be familiar. The specific exceptions include the need for more emphasis to be placed on (a) the micro-economic underpinnings of telecommunications policy and regulation and (b) both the international and domestic legal underpinnings of ICT policy and regulation. In addition, we found that much of the course content concentrates on information and issues associated with the traditional wireline voice network and that, in general, more emphasis needs to be placed on issues associated with

wireless networks and on the growth of data communications networks accessible to the general public – i.e., the Internet.

With one important caveat, we are also comfortable with the depth of coverage. In particular, we are largely comfortable with the depth of coverage at the basic or post-graduate diploma level. In order for the courses to meet masters level requirements, however, we conclude that the largely descriptive materials associated with the courses as they currently exist need to be augmented with (a) more underlying theory from the various disciplines and with (b) learning tasks and activities that, accordingly, reflect more sophisticated analytical capabilities. With regard to the former, we would include the underlying micro-economic and legal bases mentioned above as well as incorporation of, for example, political science research on bureaucracy and bureaucratic decisionmaking. With regard to (b), we understand that the upcoming course developers meeting at UNISA in Pretoria will focus on the construction of appropriate learning tasks/activities. As we noted above, meeting masters level requirements is important to the long term development of reciprocity agreements among African and American institutions.

## Section II – "Gap and Overlap" Analysis

### A. Introduction

As noted earlier, the purpose of this section of the report is to systematically identify (1) important material that may not be covered any of the ten courses (the "gap" analysis) and (2) material that appears to covered in more than one course in a way that seems unnecessarily duplicative or inconsistent (the "overlap" analysis). We have also included suggestions for additional materials – and sources of materials – that may be useful to course developers.

The methodology we used for identifying overlap was straightforward – we merely compared and contrasted the course materials posted on the NetTel@Africa KEWL website and, where it appeared that there was potential overlap, we investigated further. The appropriate methodology for conducting the gap analysis was not as straightforward because, obviously, we first needed a comprehensive list of agreed upon topics that should be covered somewhere in the total program. We compiled such a list on an informal basis by reviewing (a) the original materials/agreements from the initial meetings of the NetTel@Africa Network, (b) the comments on content that were made during the recent meeting in Botswana, and (c) the contents of two internationally-oriented books on the topic of telecommunications policy and regulation. With respect to the latter, we used the book entitled Telecommunications Regulation Handbook by Hank Intven and published by the World Bank and the book entitled Telecom Reform: Principles, Policies and Regulatory Practices by William H. Melody (Ed.) and published by Lyngby, Denmark: Den Private Ingeniørfond, Technical University of Denmark. I also used my own experience in developing programs and courses in telecommunications policy and regulation over the past twenty-five years.

#### 1. Macro Environments and Implications for Telecommunications (TR 501)

Based upon our own review and the comments made in conjunction with the NetTel@Africa SAFARI meeting in Botswana, the principal gaps identified include (a) a lack of adequate treatment of micro-economic principles as opposed to macro-economic concepts, (b) a lack of adequate treatment of continental/regional institutions such as the ATU and TRASA, as opposed to more globally focused institutions such as the ITU and the World Bank, (c) the need to

address the topic of convergence and certain recent trends such as the shift from fixed to mobile markets/technology.

With regard to micro-economic principles, in a market-oriented economy, regulation – the justification for government to intervene in a particular market – is often based upon the notion of market-place failure. This approach is typically taught by first describing the workings and benefits of a competitive market (e.g., in terms of promoting efficiency and rewarding entrepreneurship and producers who respond to consumer needs and changes in the market) and then describing conditions under efficient pricing is not obtained due to market-place failures. Such failures can be produced when there are only a limited number of sellers and buyers (e.g., monopoly or monopsony[1] power is exhibited), where buyers and sellers only have imperfect or asymmetric information on the goods or services at issue, where there are externalities involved (e.g., network externalities in certain telecommunications networks), where there is collective action failure, or where there are agency or principal-agent problems. Government intervention is then justified based upon the need to correct the market-place failure. For example, under traditional economic regulation, market-power on the part of producers might lead to regulation of prices and the terms and conditions under which the product is offered or, if there is asymmetrical information favoring the producer, appropriate product labeling might be required. In telecommunications, tariffing requirements and a tariff approval process are often the means of achieving such results.

Of course, government intervention in the market is often justified not just on the grounds of promoting economic efficiency alone, but also on the grounds of promoting equity, fairness and social justice as well. The latter reasons for government intervention in the telecommunications marketplace are addressed in the course, but I recommend that micro-economic materials be added that explain the workings of competitive markets, describe the economic notion of market-place failure in rather formal terms, and relates, in a brief and introductory way, the steps governments can take to correct for such failures. Although most of this information is readily available in standard economic text books and books on economic regulation, I can provide information from a number of sources if needed.

With regard to the apparent lack of adequate treatment of continental/regional institutions in the course as it now stands, I am confident that the course developers are well aware of those institutions and can incorporate the required information without our assistance. As mentioned above, it is also recommended that material on convergence be added to the course. The European Commission's Green Paper on the Convergence of the Telecommunications, Media and Information Technology Sectors explains convergence as follows:

> Traditionally, communications media were separate. Services were quite distinct - broadcasting, voice telephony and on-line computer services. They operated on different networks and used different "platforms": TV sets, telephones and computers. Each was regulated by different laws and different regulators, usually at national level. Nowadays digital technology allows a substantially higher capacity of traditional and new services to be transported over the same networks

[1] At a recent U.S. Federal Trade Commission meeting, it was stated that, conceptually, monopsony can be viewed as the flip side of monopoly -- it is substantial market power being exercised by buyers over sellers.

> and to use integrated consumer devices for purposes such as telephony, television or personal computing.
>
> Telecommunications, media and IT companies are using the flexibility of digital technologies to offer services outside their traditional business sectors, increasingly on an international or global scale.[2]

Subsequently, Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 entitled "On a Common Regulatory Framework for Electronic Communications Networks and Services" (Framework Directive) concluded that the convergence of the telecommunications, media and information technology sectors means that all transmission networks and services should be covered by a single regulatory framework. That regulatory framework consists of the Framework Directive and four specific Directives dealing with issues such as access and interconnection, universal service, and data protection.[3] A comparison of the U.S. and European response to convergence can be found in a recent FCC Working Paper entitled "The Potential Relevance to the United States of the European Union's Newly Adopted Regulatory Framework for Telecommunications."[4]

Finally, it is recommended that a small amount of additional material be added to the technology portion of Module One of the course. As currently presented, the sections on "Wire and Cable Technology" and "Wireless Technologies" focus mostly on transmission or transport technologies rather then higher level aspects of the technological revolution as exemplified by the shift from analog to digital transmission, the shift from circuit switching to packet switching, and the other changes that are producing "convergence" as described above. Essentially no mention is made of the Internet in these sections. In addition to discussing the underlying transmission technologies, more material should be supplied to discuss the various telecommunications networks or "platforms." Switching, advanced multiplexing, and increasingly powerful consumer devices are the other parts of these platforms that should at least be introduced.

In terms of overlap, since TR 510 is designed to be an overview course, it is not surprising that many parts of the course are covered in more detail in other courses – indeed, that was the intent as we understand it. We do have some concerns about the overlap with the introductory material on policy making and regulation in TR 504 but we will deal with that potential overlap when we address that course later.

2. ICT Technologies (TR 502)

We participated actively in some of the early planning for this course. In addition to reviewing the current version we also noted the comments made in conjunction with the NetTel@Africa SAFARI meeting in Botswana. The principle gaps include the following: (a) a lack of a clear connection between the technical information being presented and the policy/regulatory issues being addressed elsewhere in the Network, (b) a lack of practical examples of how telephone

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[2] See: http://europa.eu.int/ISPO/convergencegp/ip164en.html

[3] See: http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/documents/l_10820020424en00330050.pdf

[4] Available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-224213A2.pdf

calls are handled or data communication sessions established and maintained, and (c) at least in some cases, a lack of network architecture or systems level material for different platforms as opposed to too much "physical layer" technical detail.

In order to make the technical materials more relevant to students with a non-engineering background, it is suggested that additional content be added that links the technical discussion to a past, or preferably, current policy or regulatory issue. For example, the description of digital transmission and the process of analog-to-digital conversion can be linked to the policy issue of when a country should make the transition from analog broadcasting to digital broadcasting. Similarly, a higher level description of the architecture of the ordinary (incumbent's) public switched telephone network can be linked to the policy/regulatory issues associated with where new entrants should be allowed to interconnect with the established network. In the U.S., for example, wireless carriers can interconnect with the incumbent carrier's network on the "line side" of the local central office switch, on the "trunk side" of the local central office switch, or at the tandem switch that connects to multiple local central offices. The description of the component parts of the traditional local network can be linked to issues of unbundling – e.g., loop unbundling that is currently a hot issue, at least in developed countries. We recommend that the course developers review each module in order to develop representative policy and issues that are associated with the technical discussions. Ideally, these would relate specifically to policy and regulatory issues that are dealt with in depth in the other courses. For example, the discussion of the local loop portion of the traditional local exchange network should support the discussion of local loop unbundling discussed in TR 503. If desired, we would be happy to assist the course developers in identifying these links.

In order to make the technical material more relevant to policy makers and regulators on an "every day" basis, it is recommended that content be added that would trace how ordinary telephone calls are handled or how data communications sessions are established and maintained. We suggest that this should be done for each major telecommunications infrastructure platform. For example, it is suggested that the sequence of events that occurs in setting up, maintaining, taking down, and billing for calls on the traditional wireline telephone network be described. This sequence of events can then be compared and contrasted with the analogous events that take place when a voice call is placed over a wireless mobile (e.g., GSM) network or when a Voice-over-IP call is placed using the Session Initiation Protocol (SIP). Similarly, descriptions of how "dial up" modem calls are made over analog facilities could be compared with circuit switched data calls made over ISDN facilities. These in turn can be compared and contrasted with data sessions established over combinations of Local Area Networks (LANs) and Wide Area Networks (WANs). The objective should be to get the student to feel comfortable with technology by relating it to everyday activities – e.g., placing a telephone call, sending an email, or browsing the World Wide Web – in response to the gap identified in item (b) above. Finally, in order to facilitate the presentation of these processes, higher, systems-level descriptions of the network architectures of each major telecommunications platform should be included as called for in item (c).

Since TR 502 is intended to provide students with the basic technological underpinnings needed to understand and participate effectively in policy and regulatory activities, the overlap with other courses is minimal. However, it is strongly recommended that the technical descriptions in TR 502 be tied to and made consistent with the technical descriptions that are included in other

courses – for example, in TR 504 on spectrum management and in the discussion of technologies for universality in TR 507.

3. ICT Industries and Markets (TR 503)

Based upon our own review and the comments made in conjunction with the NetTel@Africa SAFARI meeting in Botswana, we did not find substantial gaps in coverage in this course. Mainly the suggestions centered on adding concrete examples or expanding on points already covered. We assume that the course developers are already taking steps to do so and we stand ready to help in that endeavor. Many of the comments focused on the issue of interconnection. As stated in TR 508: "Regulators around the globe consider interconnection to be the single most important issue in the development of a competitive market place for telecommunications services." Melody describes it as the 'cornerstone of competition.' Therefore it is critical that students have a firm grasp of the policy and regulatory aspects of interconnection including technical, economic and operational considerations.

With regard to the technical aspects of interconnection, we recommend – as we stated earlier – that the technical aspects of interconnection be dealt with in some depth in TR 502, ICT Technologies. This would include, for example, a technical description of how interconnection can be achieved between or among incumbent providers, competing wireline and wireless providers, and value-added network (VAN) and Internet Service Providers. This course, TR 503, could briefly summarize those descriptions as well as point the student to the TR 502 course material for more details.

In the current version of TR 503, economic terms of interconnection are treated very briefly in the course and the student is directed to the book by Intven for some details regarding Internet and mobile/wireless interconnection charges. As discussed later, interconnection is also dealt with in some detail – indeed comprehensively – in TR 508, Service Pricing. In fact, the material contained in TR 508 goes far beyond just pricing (no criticism intended) and includes, for example, (a) discussions of the technical forms of interconnection (which are missing from TR 502 as we noted before), discussions of interconnection principles which are also discussed in the subject course, TR 503, (c) information on the actual contents of interconnection agreements (which some participants in Botswana recommended be included in TR 502), and (d) information on policy guidelines for interconnection in COMESA countries.

Overall, and in view of its over-shadowing importance in modern ICT policy and regulation, we are generally very pleased with the total content on interconnection. However, we strongly recommend that the course developers of TR 502 (ICT Technologies), TR 503 (ICT Industry and Markets), and TR 508 (Service Pricing) work together to (a) distribute the content appropriately and consistently across the three courses and (b) develop "pointers" from one course to another to enable the student to develop a complete and in-depth understanding of interconnection even though the content is necessarily and appropriately distributed among multiple courses.

In terms of other overlapping content dealing with another important topic, we note that licensing is addressed in the subject course (TR 503) as well as in TR 501 (Macro Environment and Implications of Telecommunications), TR 504 (Spectrum Management), TR 506 (Approaches to Regulation), and TR 507 (Universality and Quality of Service Regulation). Although we do not have any specific comments on the licensing material in TR 503 (we generally regard it as excellent), we do recommend that, as in the case of interconnection, that

the respective course developers coordinate among themselves to distribute the content appropriately and to provide relevant pointers among the courses. For example, the use of auctions to award licenses is discussed in several of the courses.

4. Spectrum Management (TR 504)

The principal gaps in this course identified at the meeting in Botswana revolved around (a) the need to elaborate more on the concepts of property rights, licensing, and commons as related to spectrum management and (b) the need for expanded treatment of the legal aspects of spectrum management – including international treaty obligations etc. Although I did not attend the meeting in Botswana, I believe that first point relates to fact that many observers are concerned about the bureaucratic rigidity associated with traditional, centralized, administrative approaches to spectrum management – especially in the wireless world where technology and markets are changing so rapidly. In addition to proposals that would simply try to improve the existing administrative approaches to managing the resource, some countries have moved in the direction of a more market-oriented approach wherein exclusive rights to use the resource are traded on a decentralized basis more like other resources and licensees are given much greater flexibility in how and for what purpose they use the resource they control.

Another method for reducing administrative rigidities revolved around what has become referred to as the spectrum commons approach wherein unlimited numbers of unlicensed spectrum users are allowed to share spectrum as long the devices used conform to specified technical standards (e.g., maximum power restrictions) and/or etiquettes. This approach builds upon the rather phenomenal success of unlicensed devices in the marketplace. These different approaches are discussed at length in a recent report of the Spectrum Policy Task Force (SPTF) of the Federal Communications Commission in the U.S. They are also addressed in some subsequent proceedings. Copies of the SPTF report are available on the Commission's website.[5] A related paper on unlicensed devices/systems is also available.[6] The International Telecommunications Union has also published an excellent report on the economic aspects of spectrum management more generally.[7]

I agree with the need for expanded (and perhaps more systematic) treatment of the legal aspects of spectrum management and believe it could be best achieved by dealing with the legal issues in the order of international processes, agreements and recommendations (e.g., those flowing from World Radio Conferences and ITU Study Group – e.g., ITU-R – recommendations), regional and bi-lateral negotiations and agreements, country-specific legislation/rules/regulations dealing with spectrum, and, finally, stakeholder rights and obligations. The suggestion regarding following this order was reportedly made at the meeting in Botswana. This discussion of the legal aspects of spectrum management should be coordinated with material to be added to TR 509, Policy, Law and Institutions. We would be happy to assist the course developers in this effort.

With one exception, we do not believe that overlap is a significant problem but, as we have before, we would urge the respective course developers to coordinate among themselves to

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[5] http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-234741A1.pdf

[6] http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-234741A1.pdf

[7] Report ITU-R SM.2012-1, Economic Aspects of Spectrum Management, International Telecommunications Union, Geneva (1997-2000)

distribute common content appropriately and to provide relevant pointers among the courses. For example, spectrum licensing (including auctions and comparative hearing processes for awarding licenses) is discussed in both this course (TR 504) and in TR 503, ICT Industry and Markets.

The exception mentioned relates to the significant amount of material in the course that relates to such issues as policy planning and politics, dealing with legal problems and the law, and the regulatory life cycle. While we feel that this is excellent, informative material, it is also quite clear that much of it applies to policy making and regulation much more broadly. In some cases this material overlaps with content provided elsewhere and in other cases it provides and an additional (and, typically useful) perspective on policy planning and regulation. In addition to the general materials on policy-making and regulation contained in TR 501 (where some overlap would be expected because it is designed as an introductory course), this general topic is also included in TR 506, Approaches to Regulation, and, to some extent, in both TR 507, Universality and Quality of Service Regulation and TR 509, Policy, Law and Institutions. Once again, we would urge the respective course developers to work together to harmonize (as appropriate) and distribute the content relating to policy making and regulation generally among the different courses. Because spectrum management is a very specific and specialized topic and because, in our opinion at least, it could be beneficially treated in more detail in the course, we would respectfully suggest that much of the more general, non-spectrum specific material be shifted to TR 501, TR 506 and TR 509. Such a shift would allow more in-depth treatment of the important role that the International Telecommunications Union plays in spectrum management (e.g., through the regular World Radio Conferences and through the work of its technical groups such as ITU-R) as recommended earlier plus additional or more in-depth treatment of such topics as license fees and spectrum pricing, radio-frequency (RF) exposure (health) issues, spectrum policy and rural network development, spectrum monitoring (observation and measurement of environmental radio signals to support the spectrum management process – e.g., for spectrum planning, compliance, interference resolution, and detecting unauthorized usage), non-technical descriptions of engineering techniques used to facilitate more efficient use of the resource though spectrum sharing, developing radio service frequency plans (band plans), automated planning, analysis and licensing tools, role of and processes for equipment authorization, emerging technologies, and, as discussed earlier, various techniques for reducing bureaucratic delays and administrative rigidities – including property rights and spectrum commons models.

5. Financial Analysis (TR 505)

Based upon our own review and the comments made at the meeting in Botswana, there do not appear to be any major substantive gaps in the coverage of the finance, the topic of this course. There was a suggestion that the course needs a micro-economics module. The same suggestion was made in conjunction with TR 501, Macro Environments and Implications for Telecommunications. We agree that additional attention needs to be paid to micro-economic principles somewhere in the curriculum. Because it under lays so much of the material throughout the program, we recommend that it be treated in some depth in TR 501 and then summarized in TR 505. We do acknowledge that the current version of TR 505 does contain material relevant to a discussion of market failures – e.g., the asymmetric information and agency problems.

Rather than identifying any major gaps, the concerns of the attendees in Botswana seemed to be focused on such issues as the volume of the content (i.e., too much) and the lack of a clear connection to the immediate needs and daily activities of the regulator. We assume that the course developers will take these comments into account, including in the development of interactive learning activities.

We did not detect a significant or inappropriate amount of overlap between the content of TR 505 and other courses. However, we would urge the developers of this course and TR 508, Service Pricing to more formally coordinate their courses because of the important links between the topics covered in each – i.e., costing and pricing. Our remaining concern does not relate to either gaps or overlaps. Instead, we are concerned about what appears to be an excessive focus on American examples and policy (e.g., the use of American taxes and American Generally Accepted Accounting Practices – GAAP.) We recommend that this be corrected in the next version of the course.

6. Approaches to Regulation (TR 506)

This course is currently not well developed. It consists of just 33 pages of largely summary-style materials at a fairly high level of abstraction. For this reason, it is difficult to conduct a detailed gap and overlap analysis. One recommendation that came out of the meeting in Botswana is that the course materials need to be augmented to address interconnection guidelines, facilities leasing and sharing guidelines, type approval, independence of the regulators, legal structure of regulation, role of regulator in determining market structure, content regulation and processes for monitoring and enforcing regulations. Because of the current state of development, we do not believe it is appropriate to carry out a more detailed analysis.

7. Universality and Quality of Service Regulation (TR 507)

We found this course to be well developed and without major gaps. We agree, however, with the comments from the meeting in Botswana that recommended an increase in the coverage of ICT versus telecommunications or even telephony alone. Generally speaking, we are also in agreement with a number of specific recommendations that relate primarily to the existing content rather than to identifying major gaps in coverage.

In this same category of suggestions relating to the existing content, we would recommend including some additional material dealing with the importance of administering universal service subsidies in ways that minimize artificial distortions in the choice of technologies (e.g., wireline versus wireless) and providers (e.g., incumbents versus emerging competitors). While we find that the descriptions of the U.S. experience with universal service are accurate, we believe that, as is often the case, the role of the Rural Electrification Administration (REA), now renamed the Rural Utilities Service (RUS), is under emphasized. My own belief is that REA/RUS provided technical support and, especially, its traditional infrastructure loan programs have played major roles in promoting universal service in the U.S. These infrastructure loan programs include hardship, cost of money, Rural Telephone Bank, and guaranteed loans. More information on these programs is available at http://www.usda.gov/rus/telecom/.

We would add one additional comment regarding the Quality of Service discussion; namely, it would be useful to connect the discussion to some of the broader discussions of micro-economics and economic regulation. For example, it doesn't make sense to talk about a price for a service without specifying the associated quality. A decrease in quality at a constant price is equivalent

to an increase in price and *vice versa*. In price cap regulation, this is particularly important because, with the price fixed, the regulated company, in the absence of competition, has the incentive to lower quality to increase profits. In developed countries, cellular and other mobile services have often been designed with a higher blocking probability (one measure of the quality of circuit switched connection) in order to reduce the number of base stations (and hence the costs) of the network – especially in rural areas. It is recommended that these connections and tradeoffs be explored in more detail.

On another point, we find that the portion of the course entitled "Technologies for Universality" to be slightly outdated. For example, it does not – to any extent – cover the rapid growth in the use of unlicensed wireless technologies (e.g., IEEE 802.11 – "Wi Fi" and related systems) to provide Internet access in rural and other unserved areas – including in many developing countries. In conjunction with a recent USAID project in Romania, one of my colleagues has put together a comprehensive list of WLL technologies, including those intended for use on an unlicensed basis. I will be glad to share that material with the course developers. As discussed earlier, we also recommend that the technology discussion in this course be linked to, and made consistent with, the broader technology discussions in TR 502, ICT Technologies.

Finally, in terms of possible overlap, we observed once again that some of the more general material on regulation contained in TR 507 (e.g., the discussions of policy-making versus regulatory functions and privatization and liberalization) potentially duplicates similar discussions in TR 506, Approaches to Regulation, and TR 509, Policy, Law and Institutions. As before, we would urge the respective course developers to work together to harmonize (as appropriate) and distribute the content relating to policy making and regulation generally among the different courses.

8. Service Pricing (TR 508)

Only a limited set of rather cryptic comments from the meeting in Botswana were available on this course. Based upon those limited comments and our own additional review of the materials, we are concerned that there is not enough policy and regulatory focus in the topics covered; namely, basic cost/management accounting, tariffs and tariff accounting, interconnection, and pricing issues. Stated another way, these topics, and the examples used to illustrate them, tend to be addressed from the perspective of a provider (often, even, a non-telecommunications provider) rather from the perspective of the regulator. Where the perspective of the regulator is taken, there is a lack of depth and the material often seems dated. For example, in the discussion of management and financial accounting, the special information needs of a telecommunications regulator are not discussed and, similarly, cost allocation is approached primarily in terms of the needs of the firm. Cost allocation is often of special importance in telecommunications regulation in terms of detecting cross-subsidization or, as in the US, for jurisdictional cost separation purposes.

In terms of being dated, much of the material cited is from the early 1990s and much has changed since then in terms of the state-of-the-art in telecommunications pricing theory and practice. For example, there is no mention made of the Internet. Generally speaking, in the Internet, interconnection agreements are reached through commercial negotiations rather than in a regulated environment. Those agreements have little in common with the international settlements process used in traditional voice communications and discussed at considerable length in the existing course material.

Without attempting to be exhaustive, we would recommend that material be added on the following topics:

(1) Price regulation starting with a very brief description of traditional methods (e.g., rate-of-return regulation) and then shifting to a more detailed description of modern price cap regulation (including a discussion of the needed information requirements). The content could track the corresponding material in the books by Intven and Melody referenced earlier and in several books that I will list at the end of this section.

(2) Cost structures and cost and demand characteristics of telecommunications networks. As noted above, the existing materials do not focus on telecommunications networks nor, more specifically, on the cost characteristics of different portions of such networks (terminal equipment, access, switching, transport etc.) and the trends in those costs. This added content could follow the corresponding material in the book by Melody and in several of the books listed later.

(3) Cost analysis and cost modeling for regulatory purposes. Cost analysis and cost modeling is especially important in, among other things, establishing reasonable (e.g., cost-oriented) rates for interconnection, for estimating the cost of providing universal service and, hence, the amount of subsidy required (e.g, the size of a universal service fund), and for establishing the costs and prices for using portions of the incumbent provider's network (e.g., unbundled network elements). Once again this added content could follow the corresponding material in the books by Melody and Intven and in several of the books listed later.

(4) Pricing theory and practice in a regulatory context. As mentioned briefly before, the course materials taken as a whole are inadequate in terms of the treatment of micro-economic principles. While the existing material in this course (i.e., TR 508) deals with pricing (especially in the context of interconnection) it lacks a theoretical underpinning that is necessary in a graduate level course. The added content can be drawn from the book by Melody to a certain extent and draw on any number of books including, for example, the book entitled Telecommunications Pricing: Theory and Practice by Mitchell and Vogelsang listed below. The added content should, for example, include discussions of marginal cost pricing, cross-elasticity of demand, Ramsey pricing and the other topics suggested in the comments from the meeting in Botswana.

(5) Rate rebalancing is an important issue both inherently and in illustrating economic theory and practice in a policy and regulatory setting. Because of this importance, it is recommended that additional material be added on the topic. One possibility would be to use rate rebalancing in a particular country as a case study.

(6) Service pricing and interconnection issues associated with the growth of the Internet. As noted in the introductory material above, the rapid growth of the Internet and in Voice-over-the-Internet Protocol (VoIP) has raised a host of interconnection and pricing issues. Examples include flat-rate versus usage sensitive prices for dial-up access to the Internet, the impact of VoIP on international settlement rates, prices for dedicated facilities (e.g., E1/T1) for accessing the Internet, and peering and transit agreements among Internet backbone providers.

The additional sources of material mentioned above are disclosed immediately below. Once again, the list is not intended to be exhaustive – only illustrative of more current materials that might be useful to the course developers.

Cave, Martin (Ed.) (2002). Handbook of Telecommunications Economics.: North-Holland.

Courcoubetis, Costas and Richard Weber (2003). Pricing Communications Networks: Economics, Technology and Modeling. New York: John Wiley & Sons.

Gasmi, Farid, D. Mark Kennet, William W. Sharkey, Jean-Jacques Laffont (2002). Cost Proxy Models: A New Emperical Approach. Cambridge: MIT Press.

Mitchell, Bridger M. and Ingo Vogelsang (1992). Telecommunications Pricing: Theory and Practice. Cambridge: Cambridge University Press.

We did not detect any major problems in terms of overlap between the content of TR 508 and other courses. However, if the TR 508 course developers follow our recommendation regarding adding micro-economic material, we suggest that they coordinate with the course developers of TR 501 where adding such material has been suggested as well.

9. Policy, Law and Institutions (TR 509)

This course contains very valuable content – e.g., the description of leadership – but, as the comments from the meeting in Botswana reflect, it does not really focus on policy, law and institutions. This represents a major gap. The comments from the meeting suggest that strong input from an attorney is needed. We agree. While I am not an attorney, I have taught similar or related content in the past. The following is a rough outline of the approach that I use to teaching this content primarily in the U.S. context:

***Background and Introduction***

In this section, I briefly describe different political systems and democracy and democratic institutions. I describe the basics of a market-oriented economy and introduce such concepts as market failures and public goods. I approach these topics from a Public Choice standpoint.[8] I discuss the conditions that are necessary for markets to flourish using, for example, the five elements identified by McMillan: information flows smoothly, property rights are protected, people can be trusted to live up to their promises, side effects (externalities) are curtailed and competition is fostered.[9] I stress the importance of "the rule of law" and discuss its various elements as well. I discuss the production of public goods and introduce the notion of government failure in contrast to market failure. I briefly introduce regulation as an external discipline on industry players and I stress the importance of regulatory independence and accountability. More specifically, I emphasize the importance of transparency in the regulatory process including open records, open evidence, public meetings and hearings, public access and opportunity for public participation.[10]

***International Organizations and Constraints***

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[8] One book on Public Choice that recognizes differences among political systems and perhaps cultures is available on-line. The author is J. Patrick Gunning and the title is Understanding Democracy. It is available at: http://knight.fcu.edu.tw/~gunning/votehtm/cont.htm.

[9] McMillan, John, Reinventing the Bazaar: a natural history of markets, W.W. Norton & Company, New York (2002).

[10] Following, for example, Ashley C. Brown, "Public Services and the Process of Regulation" 2001.

In this section, I introduce the International Telecommunication Union (ITU) as a UN agency concerned with the coordination of global telecommunications networks and services. I briefly discuss the ITU in terms of its history, structure and processes. Although somewhat dated, I refer students to George Codding's and Anthony Rutkowski's book entitled The ITU In A Changing World (1988) and, for additional history, to George Codding's classic The International Telecommunications Union: An Experiment in International Cooperation (1972). For the "pre-Intenet" era and issues I also refer students to James Savage's The Politics of International Telecommunications Regulation (1989). I also deal at some length with the World Trade Organization (WTO) and the General Agreement on Trade in Services and the Annex on Telecommunications because of its current influence on telecommunications policy and regulation at the domestic level. I also discuss the Internet Society (ISOC) and the development of Internet technical standards through the IAB, IETF and IRTF. I describe the stresses that the Internet has placed upon international regulatory regimes and the geopolitics of Internet governance. I also mention briefly other international organizations relating to ICT policy and regulation including the World Intellectual Property Organization (WIPO), the International Standards Organization (ISO), ICANN and a host of industry-led standards groups.

***The Constitution and the Roles of Each Branch of Government***

Beginning with standard definitions of policy "as a governing set of principles, perhaps a plan of action, to be used in the making of particular decisions" and public policy "as policies made by government bodies or officials in carrying out their individual duties," I turn to the major levels of public policy in the U.S. context starting with the Constitution at the upper-most level. I very briefly discuss the parts or clauses of the Constitution that arise most frequently in ICT policy and regulation and provide examples.

I also discuss the three branches of the federal government – legislative, executive and judicial and their respective roles in telecommunications policy. I also introduce the notion of the independent regulatory agency and very briefly describe the associated history. This includes identifying the Federal Communications Commission and other independent regulatory agencies and their roles. Obviously this section would need to be changed extensively to reflect the specifics of different countries in Africa.

***Legislation Relevant to Telecommunications Policy and Regulation***

Following the discussion of the Constitution and its impact, I turn to telecommunications legislation – that is, bills proposed and laws (or, equivalently, statutes and acts) passed by Congress. I discuss the various Committees and Subcommittees in Congress that are involved in ICT policy and I describe the process by which a bill becomes law. I then describe in some detail the Communications Act of 1934 (as amended). I describe the major amendments made to the '34 Act in 1996. I also identify other laws such as the Administrative Procedures Act and the Advisory Committee Act that are important in telecommunications policy formulation. While the passage of legislation is the direct way by which Congress establishes policy, I also identify indirect ways such as through oversight hearings, studies and investigations, confirmation of appointees, and authorizations. Obviously this section would need to be changed extensively to reflect the different forms of government, e.g., the parliamentary system, and traditions of African countries.

***An In-Depth Look at the Federal Communications Commission as an Independent Regulatory Agency***

In this section, I describe, in a fair amount of detail, the organization of the FCC and recent steps that the agency has taken to reform itself (e.g., see http://www.fcc.gov/Reports/fcc_reform_091301.html). I also describe the rulemaking procedures that the Commission uses in its quasi-legislative role of developing policies and rules in accordance with the Communications Act and other legislation. I work with the students in assessing the regulatory independence and accountability of the agency and in evaluating how both the organizational structure and processes compare with international norms, e.g., in terms of transparency.

As some authors have observed "….the literature on the regulatory commissions [such as the FCC] is replete with formalistic, legalistic, and purely descriptive accounts of how the agencies are structured, what there legal powers and authority are, and what the have done or not done." I try to move beyond the purely descriptive accounts of the organization and formal processes of the agency and discuss how the decisions made by the agency can be "understood not only as a *rational actor*, making policy for intellectual reasons,…but also as an *organization* and as a *political actor* which tend to make policy for reasons of their own."[11] In this discussion, I also draw upon Public Choice theory. In addition to policymaking through the rulemaking process, I also describe the tools that the FCC has to enforce its rules and describe the agency's other roles, for example, in terms of consumer education/protection. As before, it is obvious that, although much of the underlying theory is applicable, this section would have to be modified substantially to study African regulatory institutions and traditions.

***Other Departments and Agencies Involved in Telecommunications Policy***

In the U.S. governmental structure, several other agencies play important roles in ICT policy. At the federal level of government these agencies include, for example, the National Telecommunications and Information Administration in the U.S. Department of Commerce, the Antitrust Division of the U.S. Department of Justice and Federal Trade Commission (FTC), the Rural Utilities Service of the U.S. Department of Agriculture, the General Services Administration as a major purchaser of ICT equipment and services, and the U.S. Department of State. At the state level of government, state legislatures and, especially, state public utility commissions play a major role in telecommunications regulation. In this section, I briefly describe these various agencies and their roles. Once again, this section would have to be changed entirely to reflect country-specific African institutions.

Because of the limited amount and unique content of the material supplied with the course, we did not detect any major problems with overlap.

10.ICT Applications (TR 510)

At the time when we conducted our analysis, no materials for this course were available to us.

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[11] Gail Crotts Arnall and Lawrence M. Mead, "Decision Making at the FCC," Leonard Lewin (ed.), Telecommunications : An Interdisciplinary Text, Artech House Inc., 1984, pp. 38 - 93.

**Section III – Summary and Conclusions**

With some exceptions noted earlier, we are generally quite pleased with both the scope and the depth of NetTel@Africa course materials we reviewed and are confident that the courses proposed and described will prove extremely valuable to policy-makers and regulators throughout the Africa and, hopefully, in the longer term, elsewhere.

# *Attachment D: eLearning Design Assessment Rubric*

The following four aspects of each NetTel@Africa course will be assessed by a panel of eLearning experts:

1. Learner Support and Resources
2. Online Organisation and Design
3. Instructional Design and Delivery
4. Assessment and Evaluation of Student Learning

Specific topics within each area will be evaluated using a four-point scale:

1. Lacking – A given topic is not positively addressed. Development is needed.
2. Baseline – The quality of a given topic is positive but does not meet expectations, considerable improvement is needed.
3. Effective – The quality of a given topic meets expectations, however some improvement is needed.
4. Exemplary – The quality of a given topic exceeds expectations.

I. Learner Support and Resources

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Course Information** | Missing | Course has limited information for online learner support and resources. | Course contains some information for online learner support and resources. | Course includes important information about being an online student and links to support areas for NetTel. |
| **On-line Support** | Missing | Course provides some resources to support online student learning. | Course provides course specific resources to support online student learning. | Throughout the course are links to a variety of courses-specific resources to enhance online student learning. |
| **Content Support** | Missing | Course offers access to few resources supporting course content. | Course offers access to some resources appropriate to supporting course content. | Course offers access to a wide range of resources appropriate to this course. |
| **Channels for Feedback on Resources and Support** | Missing | Opportunities for students to give feedback to faculty are limited. | Student feedback regarding learner support and resources is actively sought. | Student feedback regarding learner support and resources to make modifications is actively sought when appropriate. |

II. Online Organisation and Design

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Completeness** | Missing | Much of the course is under construction, with some key components identified such as the syllabus. Not all of the course content has been modified for the web. | The course is organized and navigable. Students can understand the key components and structure of the course; the course is organized and easy to follow. | Course is well organized, easy to navigate, and logical. Students can clearly understand all components and structure; the course is well-organized and easy to follow. |
| **Clear Syllabus** | Missing | Course syllabus is unclear about what is expected of students. | Course syllabus identifies and delineates the role the online environment will play in the course. | Course syllabus identifies and clearly delineates the role the online environment will play in the total course. |
| **Aesthetic Design** | Missing | Aesthetic design is rudimentary in conceptualization and construction. | Aesthetic design presents and communicates course information. | Aesthetic design effectively presents and communicates course information. |
| **Consistent and Functional** | Missing | Web pages are visually and functionally inconsistent. | Web pages are mostly consistent visually and functionally. | Web pages are visually and functionally consistent. |
| **Accessibility** | Missing | Accessibility issues are not addressed. | Accessibility issues are somewhat addressed. | Accessibility issues are addressed throughout the course. |
| **Channels for Feedback** | Missing | Instructor provides no opportunity for student input and feedback. | Instructor provides some opportunity for student input and feedback. | Instructor provides multiple opportunities for student input and feedback. |

III. Instructional Design and Delivery

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Opportunities for Interaction** | Missing | Course offers limited opportunities for interaction and communication among students, to instructor, and to content. | Course offers some opportunities for interaction and communication among students, to instructor, and to content. | Course offers multiple opportunities for interaction and communication among students, to instructor, and to content. |
| **Alignment of Course Objectives** | Missing | Course objectives are not clearly defined and do not align to learning outcomes. | Course objectives are defined but may not align to learning outcomes. | Course objectives are clearly defined and aligned to learning outcomes. |
| **Clearly Defined Learning Outcomes** | Missing | Learning outcomes are vague or incomplete and performance expectations are absent or unclear. | Learning outcomes are identified and performance expectations are implied. | Learning outcomes are identified and performance expectations are clearly defined. |
| **Variety of Learning Tasks** | Missing | Course provides few visual, textual, kinesthetic and/or auditory activities. | Course provides some visual, textual, kinesthetic and/or auditory activities. | Course provides variety of visual, textual, kinesthetic and/or auditory activities. |
| **Critical Thinking** | Missing | Course does not promote critical thinking skills. | Course promotes critical thinking skills in some activities. | Course promotes critical thinking skills in multiple activities. |
| **Channels for Feedback on Instructional Design** | Missing | Student feedback is not integrated into instructional design areas of the course. | Student feedback is sometimes integrated into instructional design areas of the course. | Student feedback is regularly integrated into instructional design areas of the course. |

IV. Assessment and Evaluation of Student Learning

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Opportunities for Self-Assessment** | Missing | Instructor provides limited opportunity for students to self-assess their readiness for online instruction. | Instructor provides opportunities for students to self-assess their readiness for online instruction prior to class. | Instructor requires students to self-assess their readiness for online instruction prior to class. |
| **Alignment between Objectives, Activities and Assessments** | Missing | Learning objectives, instructional and assessment strategies are not aligned. | Learning objectives, instructional and assessment strategies are somewhat aligned. | Learning objectives, instructional and assessment strategies are closely aligned. |
| **Comprehensive Assessment Strategy** | Missing | Assessment strategies are not comprehensive, measuring only the most basic level of student knowledge. | Assessment strategies are used to measure content knowledge, skills, or performance standards. | Ongoing multiple assessment strategies are used to measure content knowledge, skills, and performance standards. |
| **Opportunities for Students to Receive Feedback** | Missing | Opportunities for students to receive feedback about their own performance are infrequent and sporadic. | Opportunities for students to receive feedback about their own student performance are provided. | Students' self-assessment and/or peer feedback opportunities exist. Regular feedback about student performance is provided in a timely manner. |
| **Channels for Student Feedback on Assessment Strategy** | Missing | Opportunity for students to give feedback on course assessments is absent. | Opportunities for students to give feedback on course assessments are occasionally available. | Opportunities for students to give feedback on course assessments are regularly available and solicited. |

# *Attachment E: Content Rubric*

## NetTel@Africa

Quality Assessment Rubric for Content

The following four aspects of each NetTel@Africa course will be assessed by a panel of ICT and Telecommunications policy and regulation experts:

5. Scope of topics covered
6. Appropriateness of depth and academic rigor
7. Inclusion of interdisciplinary design
8. Adherence to academic integrity

Specific topics within each area will be evaluated using a four-point scale:

5. Lacking – A given aspect is not positively addressed. Development is needed.
6. Baseline – The quality of a given aspect is positive but does not meet expectations, considerable improvement is needed.
7. Effective – The quality of a given aspect meets expectations, however some improvement is needed.
8. Exemplary – The quality of a given aspect exceeds expectations.

### Aspects for Quality Assessment

### I. Scope

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Course Objectives** | Missing | Description of Course Objectives provides limited information about the course's scope. | Description of Course Objectives provides some information about the course's scope. | Description of Course Objectives provides all necessary information about the course's scope. |
| **Coverage of Key Topics** | Missing | The scope of topics included in course is limited and needs expansion. | The scope of topics included in this course is adequate. | The scope of topics presented by this course is consistent with an international standard for this type of course. |
| **Relevance** | Missing | The relevance of the scope of topics | The relevance of the scope of topics | The relevance of the scope of topics is clear |

| | | | | |
|---|---|---|---|---|
| | | covered by this course is unclear. | covered is adequate. | and consistent with leading texts for the field of study (e.g. Intven's Book) |
| **Presentation of Content** | Missing | The presentation of content is unclear and/or confusing. | The presentation of content is clear and conducive to student learning. | The presentation of content is excellent and is appropriate for an international student audience. |

## II. Depth and Rigor

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Depth of eLectures** | Missing | eLectures provide limited depth on some topics and needs to be expanded. | eLectures provide adequate depth for all course topics. | eLectures provide the necessary depth of content for all course topics and enables students the opportunity to explore in more depth topics of relevance and interest. |
| **Appropriateness of Depth** | Missing | The depth of content provided is not entirely appropriate for course objectives | The depth of content provided is appropriate for course objectives. | The depth of content provided is appropriately designed for course objectives and shows sensitivity to student needs and conditions of learning environment. |
| **Rigor of Learning Activities** | Missing | Learning assignments are not adequately rigorous to provide students with proper motivation and responsibility to enable active learning. | The rigor of learning assignments is adequate for this course's objectives and level. | Learning activities engage students in active learning through relevant and meaningful challenges that emphasize deepening knowledge of topics. |
| **Assessments** | Missing | Assessments do not positively contribute to active learning and the formation of knowledge. | Assessments are part of learning activities; however they are not optimized for active learning. | Assessments are incorporated in learning activities and provide student and educators on-going feedback that enables optimized active learning environments. |

## III. Interdisciplinary Design

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Connection with other Disciplines** | Missing | Content does not capitalize on the interfaces with other disciplines that students explore in training program. | Content highlights all appropriate interdisciplinary connections; however these are not well used for student learning. | Interdisciplinary connections are incorporated in the content design and encourage students to draw connections with knowledge areas of other training program courses. |
| **Interdisciplinary Learning Activities** | Missing | Learning activities do not emphasize the use of skill sets from other training program disciplines. | Learning activities encourage students to draw on knowledge areas and skill sets that contribute to program objectives. | Learning activities inspire students to use life experiences, skills and knowledge acquired from other courses, and special talents to successfully accomplish tasks. |
| **Interdisciplinary Learning Assessments** | Missing | Learning assessments are adequate for content; however they do not measure the successful application of interdisciplinary skills. | Learning assessments measure the application of some interdisciplinary skills | Learning assessments measure the knowledge of and ability to use course content in practical and productive interdisciplinary applications. |

## IV. Academic Integrity

| | Lacking | Baseline | Effective | Exemplary |
|---|---|---|---|---|
| **Proper Permissions for using Intellectual Resources** | Missing | Not all intellectual resources integral to course design demonstrate proper permissions for use. | All intellectual resources integral to course design demonstrate proper permissions to use, but not all resources referred to as additional. | All intellectual resources demonstrate unquestionable permission to use. |
| **Quality of Citations** | Missing | Citations missing for some important statistics and notable facts. | Citations provided for all important statistics and notable facts. | Citations provided for all important statistics and notable facts and all citations are correctly and consistently formatted. |
| **Quality of References** | Missing | List of references is not consistently formatted or complete | List of references is either comprehensive or consistently formatted, but not both. | List of references is comprehensive and consistently formatted and provides an example of quality scholarship. |

## *Attachment F: NetTel@Africa Telejamboree*

ABUJA SAFARI AND WORKSHOP

CHELSEA HOTEL, ABUJA

$2^{ND}$ – $8^{TH}$ NOVEMBER, 2003

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# *Attachment G: Workshop on legal issues in telecommunications for judges and legislators*

17TH – 19TH NOVEMBER, 2003 AT NICON HOTEL, ABUJA

## DAY I NOVEMBER 17TH 2003

8.00am – 9.00am - Arrival and registration

9.00am – 9.10am - Introduction of Special Guests

9.15am – 9:30am - Welcome address by the Executive Vice Chairman/CEO NCC

9:30am – 9:45am - Welcome Statement by Denise Rollins, USAID Mission Deputy Mission Director

10.00am – 10.15am - Administrator for National Judicial Institute - Address

10.15am – 10.30am - Attorney General of the Federation - Address

10.30am – 10.45am - Minister of Communications – Keynote address

10.45am – 11.00am - Chief Justice of Nigeria – Address and Opening of the Workshop

11.00am – 11.30noon - Group Photographs and Tea Break

11.30am – 1.00pm - Delivery of Paper I

The International Regulatory Environment Experience from other jurisdictions - Commissioner Michael Copps, Tom Barkin, Paul Usoro and Steven Andzen

1.00pm – 1.30pm - Discussions

1.30pm – 2.30pm - Lunch Break

2.30pm – 4.40pm - Delivery of Paper II (Part1)

An overview of Issues in Telecommunications Regulation

* Interconnection

- Legal and Regulatory Issues (20 mins) – Steven Andzen Commercial and Technical Issues (20 mins) – Charles Joseph

* Spectrum management (30 mins) – Paul Margie

* Convergence (30 mins) – Paul Margie

4.40 pm– 5.00pm Discussions

5.00pm - End of session

7.00pm - Welcome Cocktail

## DAY II NOVEMBER 18TH 2003

8.00am – 9.00am - All guests seated

9.00am – 10.30am - Delivery of paper II (Part 2)

An overview of Issues in Telecommunications Regulation

(Continues)

* Licensing (30 mins) – Paul Usoro
* Tariff Regulation (30 mins) - NCC
* Universal Access (30 mins) – Commissioner Copps

10.30am – 11.00am Discussions

11.00am – 11.15am Tea Break

11.15am – 12.15pm - Panel Discussion

Competition Issues in Telecommunications– Paul Margie, Tom Barkin and Paul Usoro

12.15pm – 12.45pm - Discussions

12.45pm – 1.45pm - Lunch

1.45pm – 2.45pm - Delivery of Paper IV

Brief review of Nigerian Communications Commission Act 2003 – Steven Andzenge and Josephine Amuwa

2.45pm – 3.15pm - Discussions

3.15pm – 4.45pm - Delivery of Paper V

Enforcement of Regulatory Direction and the role of the Judiciary – Tom Barkin

4.45pm - 5.00pm - Close of Session

7.00pm - Dinner

DAY III NOVEMBER 19TH 2003

8.30am – 9.00am - All guests seated

9.00am – 10.00am - Delivery of Paper VI

Checks and Balances in the Regulatory Process – Tom Barkin

10.00am – 10.30am - Discussions

10.30am – 10.45am - Tea Break

10.45am – 12.15pm - Delivery of Paper VII

Judicial Review of Administrative Action in Telecommunications Regulation – Tom Barkin

12.15pm – 12.45pm - Discussions

12.45pm – 1.45pm - Lunch Break

1.45pm – 2.00pm - Vote of thanks by the host - Executive Vice Chairman

2.00pm - Close of conference

# *Attachment H: Workshop on Legal Issues in Telecommunications for Judges and Legislators*

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