



UNIVERSITY OF DAR ES SALAAM

**Enhancing Higher Education Delivery Through eLearning:  
Learning From The Experiences Of Other Universities**

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# **Enhancing Higher Education Delivery Through eLearning: Learning From The Experiences Of Other Universities**

## **Abstract**

This paper examines the concept of e learning and how it is being operationalized in contexts that are technologically more endowed than Tanzania, the purpose being to draw lessons from universities in the north and in the west. It then provides the justification for adopting e learning in Tanzania and documents the strides that have been made since the adoption of the information policy plan (INFOPOL) and Information Technology Master Plan (ITMP) at the University of Dar es Salaam.

In the final section suggestions are made about future directions. It is proposed that eLearning should be considered as an alternative strategy for addressing the acute shortage of graduate teachers in Tanzania's school system, and that the University of Dar es Salaam needs government as well as external support in building the required capacity.

## **Context for eLearning**

Information and Communications Technology (ICT) has been identified as one of the driving forces propelling the revolution in the acquisition, transmission, and validation of knowledge across the globe. (Robinson, 2002). The new technologies are responsible for rapid changes in the theory and practice of teaching and learning away from the authoritarian, teacher centered pedagogy, demonstrated in a rigid face to face setting, to a new pedagogy that is characterized by learner centered, more democratic, interactive and more flexible approaches that defy the limitations of time and place. (Collis, 1996). Through ICTE/e learning universities stand a greater chance

of reaching new targets for their Bachelors and Masters programs. And, what is more important, ICTE promises the delivery of quality education services through transformation of relationships between staff and students, and between students and students. Also ICTE/e learning promises the development of new ways of constructing knowledge, and new ways of getting feedback from the education endeavors. In an online learning setting, students assume greater responsibility for their own learning in the choice of what to learn, how to learn and when to learn, while the teacher ceases to be 'a sage on the stage' to become 'a guide on the side' (Horton,2002).

Clearly, in a globalized world that is marked by the digital gap between the technology rich and the technology poor (in terms of access to computers and the internet at school, home and at workplaces), the pace of the revolution in education delivery is bound to differ. Inequities in access to computers might be more easily seen and addressed with the infusion of such equipment in schools and universities of Africa. However, if African universities and intellectuals are to survive in the competition, it is crucial to pay attention to the new Digital Divide. Reference is made here of the gap between those students who are being taught to use the internet and computer resources in ways that enhance critical thinking and learning, and others who use computers primarily for information processing, storage and access, or to facilitate routine administrative and communications tasks.

It is encouraging to observe that some thinking has started in the East African region towards mitigating the incipient Digital Divide. This paper examines the concept of e learning and how it is being operationalized in contexts that are technologically more endowed than Tanzania, the purpose being to draw lessons from universities in the north and in the west. It then provides the justification for adopting e learning in Tanzania and documents the strides that have been made since the adoption of the information policy plan (INFOPOL) at the University of Dar es Salaam. In the final section suggestions are made about future directions.

The major issues addressed by the paper are: first, what are the preconditions for a successful e learning program? Secondly, are there alternative ways of using ICT in

education? If so, what are they and what do we want to use ICT for? Thirdly, what is the current practice of e learning in other universities? What is the practice of e learning at the University of Dar es Salaam? What can we learn from the experience of other universities?

### **What is e-Learning?**

The term e Learning simply refers to electronic learning. It is the use of computer and related technologies to transmit information, and learning materials so that they can be accessed at a distance either in real time or asynchronously. Asynchronous communication involves the use of Internet, e-mail, and the discussion forum. In this mode, materials are posted on the www, which can be accessed at a time that is convenient to the learner. However, through the synchronous mode, all communication is done at the same time. The participants in the communication exchange are logged on to the website at the same time. E learning conforms to new concepts and theory of teaching and learning by emphasizing competency based education, the centrality of tasks in teaching and learning process, collaboration among students supported by groupware and virtual companies. E learning breaks the barriers of bureaucracy by allowing direct communication, through e-mail or otherwise, between students and real life experts. Moreover, e learning has inbuilt possibilities for student self-assessment mechanisms, by means of student portfolios and assessment of group work. Access to resources that support learning is enhanced and widened to global levels through the availability of library digital learning materials.

ICT or information communication technology, on the other hand, refers to infrastructure, equipment or hardware, software, email, faxes, telephones, as well as the expertise required to manage them.

### **Rationale for e Learning**

If that is what e-Learning is, why should we bother about it? There are several reasons why we should bother about e-learning. First of all there is a huge demand for it. The demand emanates from the needs of the information society that requires people to constantly update themselves with new skills and with the current knowledge and

events happening around them and globally. This in turn calls for continuing education, regardless of how this is done. There is also a huge demand for higher education that can be acquired more flexibly without having to come to the campus. Similarly there is an increasing demand for getting connected to the outside world via Internet.

Secondly, the possibility of using technology to enhance education is great and we need to take advantage of technological advances for achieving educational goals. Thirdly, there is a need for relevant education on the www (customization of the Digital Learning Environment) so that our students make maximum benefit of the network resources. The fourth reason why we should arm ourselves with the e-learning skills is the need to bridge the gap that exists now between the more technologically advanced countries and the less endowed countries, as well as between the more advantaged communities and the marginalized communities. Moreover, e-learning provides opportunities of sharing of knowledge and advancing the frontiers of knowledge in a more cost effective and efficient way than through the conventional methods.

For the University of Dar es Salaam, the latter point is the more significant because e learning, or the integration of ICT in education is in line with the objectives of UDSM Institutional Transformation Program (ITP), which intends to see that education delivery is improved and that students' enrolment is expanded through web-based distance education.

### **What other universities have accomplished**

As the University of Dar es Salaam struggles to adopt the technology enhanced methods of delivering its academic programs, we should be mindful of the pre-requisites of the new pedagogy, and we should take advantage of the experiences of other universities. From a survey of e learning practice in universities of the north and south, three generalizations can be made. First, the starting point is a change in the mindset of both the lecturer and the students about their roles. How teachers perceive to be their role in the learning process is very crucial for the success of e learning. If teachers still want to teach the subject rather than teach the students, there are slim chances of success. Similarly, if students are not supported to learn independently and

are not provided with the opportunities that develop such autonomy, the new student will never be born.

Key among the guiding concepts in this process is the acceptance of the idea multi-literacy and diversity of perspectives, which recognizes that the student is the subject of the learning process, just as the teacher is the designer of the information systems. This approach is based on Paulo Freire's latest philosophical statements about the virtues of the progressive teacher. (Cowen & Gastaldo, 1995). Changes in the attitudes of both the facilitators and students partly hinges on recognition, by all the stakeholders in the learning process of the challenge, of determining who will teach teachers to become literate if the teachers are not literate themselves, in the sense of using technologies as means and tools for achieving cherished educational goals.

The second generalization that can be drawn from practice elsewhere is the use commercial Digital Learning Environments while at the same time developing their own course management systems or adopting open source systems. This is yet another challenge for universities in developing countries who seem to be torn between, on one hand subscribing to expensive course management systems such as Blackboard, WebCT, or TeleTop, and on the other hand, engaging in customization of open source software, both of which require expending huge amounts of resources to sustain or develop them.

The third challenge for the University of Dar es Salaam is related to the second point, and it is about determining targets or levels of achievement in the use of ICT in education. Experience elsewhere suggests that there are three levels that universities can work towards in implementing ICT in education. The lowest level is where the computer is used for teaching and learning traditional skills. This is a situation whereby an institution offers a program, predominantly in a face-to-face mode and the same institution ensures quality of the programs. The next level occurs when the computer is used for creating new skills. The learner chooses what he/she wants to learn and takes responsibility for quality assurance. This is what is normally referred to as stretching the mold, or blended learning. Face to face interactions are still highly valued. The third level is that of integrating technology with education through applying constructivist theory to e learning practice. This happens where global and

network mediated transaction are the norm and where the learner chooses what he/she wants and thus takes responsibility for quality assurance. (see Table 1). It would appear that UDSM/ITP strategic objective of integrating ICT in education targets this level of achievement, which is the highest in the ladder.

**Table1: Scenarios for introducing ICT in Higher Education Institutions**

	<i>Where local face to face transactions are highly valued</i>	<i>Where global and network mediated transactions are the norm</i>
<i>In which an institution offers a program and ensures its quality</i>	<p align="center"><b>Scenario A</b></p> Quality control of a cohesive curriculum experienced in the local setting (current situation) <b>Back to the basics</b>	<p align="center"><b>Scenario B</b></p> Quality control of a cohesive local curriculum, available globally <b>The Global Campus</b>
<i>In which the learner chooses what he/she wants and thus takes responsibility for quality assurance</i>	<p align="center"><b>Scenario C</b></p> Individualization in the local institution <b>Stretching the mold</b>	<p align="center"><b>Scenario D</b></p> Individualization and globalization <b>The New Economy</b>

However, it might be necessary to adopt a step-by-step approach, building on the needs and achievements at local level. With regard to the scenarios presented in Table 1, findings from an international comparative survey on the current and future use of ICT in higher education in Western Europe, USA and Australia suggest that change has been slow, because professional norms and values favor face to face teaching and learning while the institutional mission still focuses on the traditional target group (18-23 age group). Although student demand is changing towards more flexibility, it is observed from the study that the students highly value the face2face mode. Learning is predominantly taking place in campus based learning settings although there is a trend towards stretching the mold, where ICT in teaching and learning is used as part of a blend – not to replace traditional on-campus settings, but rather to complement them.

### **Experiences in the use of ICT**

A generalized summary of the experiences in the use of ICT in Australia, the Netherlands, Flanders and Palestine is presented below:

#### Australia

In Australia there are 14 key higher education institutes with 102,000 students who use the e learning format. Bb and Web CT dominate learning management systems with the result that three models are in existence: web supplemented, web dependent, and the fully online models. Funding for e learning is done through central budget at

institute level. There are educational development units, support for students, staff development programs, and reward system for recognizing innovation.

### The Netherlands

There is strong investment in R & D projects in the Netherlands with long a list of projects using e learning. Bb and WebCT are used predominantly. E learning is used to optimize existing approaches to teaching and learning. However, there is no institution wide orientation towards a specific educational model (e.g. competency based or problem based), and there is no shared vision about e learning in education (from learn to use towards use to learn). Also there is no clear implementation strategy: everything depends on individual staff member

### Flanders

E learning has been introduced in every higher education institution, but with varying levels of implementation. There is a limited number of institution wide implementation. Bb and WebCT are used, but there is a growing interest in use of open source e learning environment. E learning mainly supports existing pedagogical models. Research is underway about the 'new student (independent learner, self reflective, active learner, collaborator, ICT user, and planner).

### Palestine: Bethlehem University

Bethlehem University has several types of courses on offer ranging from: traditional, videoconferencing, courses on CDs, to courses on e learning platform. The mission is to bridge the gap in basic knowledge between industrials and youngsters leaving university. Supported by VLIR, the university has launched a project with several components: Videoconferencing (synchronous communication), Curriculum development (production of CDs and streaming videos for asynchronous communication), E learning: Bb platform (courses for residential students and for people from the industry), Open source software is also proposed.

### **Initiatives towards Open Source digital learning environments**

At the ICT/OLL workshop held in Gent in April 9-11 2003, three examples of open source learning environments were presented and discussed: the Knowledge Environment for Web-based Learning (KEWL), CLAROLINE, and TOLEDO.

#### Knowledge Environment for Web-based Learning (KEWL)

KEWL is being developed at University of Western Cape (UWC), in collaboration with the University of Dar es Salaam, in order to facilitate research into online learning. It is a comprehensive learning management tool that can be modified and adapted to African/third world conditions. It is available at no cost under an open source license (GNU Public License). As an active server pages (ASP) application it can run under any Microsoft operating system that supports ASP; it requires a Web server and a database server, e.g. Microsoft Data Engine (MSDE). A regional masters program in ICT, NetTel@Africa has adopted the software which now possesses a smart glossary, a search engine, and can export a course to static content for use on CD-ROM or on a static Web mirror

KEWL has a simple interface, which makes it suitable for low bandwidth environment characteristic of most developing countries. It is available to a limited number of educators because it is still under development. UWC is currently working on the development of student tracking and notification tools. Further development of the tools by other interested institutions is welcomed

#### CLAROLINE

This is a course management system (CMS) for supporting technology enhanced instruction in an integrated environment. It is being developed in Belgium at UCL after trial with Bb and WebCT. It is a free software under and open source license (GNU Public License): Open source: PHP + MySQL. However, it is still under development, version 1.4 beta has just been released.

Its strong points include student and teacher friendliness; it has the essential tools available, and doesn't require expensive hardware. Also it is very easy to translate in any language

## TOLEDO

TOLEDO started as isolated projects carried out by enthusiastic individuals or small teams, at K.U. Luven. The project gets funding internally, regionally, and at EC levels. It is based on the concept of guided independent learning, and builds on Ariadne and Bb learning management systems. TOLEDO was first installed in August 2001, but by December 2002 there were more than 1025 active courses, used by over 1250 active teachers and over 19000 active students. By the end of the year, 150,000 hits/day were recorded.

Impact at micro, meso and macro levels: At micro level, the DLS was used mainly to deliver information to students. About 20% of the courses combine functionalities of the DLS with more traditional forms of education: 'blended' learning, while 25% of the courses use the communication, assessment and assignments functionalities substantially. This suggests a positive effect on educational practices (in line with the concept of guided independent learning).

At institutional level, the DLS is also used for administrative purposes (e.g. place announcements, distribute exam schedules), while at macro level, the sharing of electronic content, experiences and tools with other universities in the consortium has been appreciated.

## **Readiness of the UDSM to adopt eLearning**

This section describes the achievements that the University of Dar es Salaam has made in Information Communication Technology for education (ICTE). An assessment is made about the readiness of the institution to be the hub in the development and deployment of ICT in teaching and learning.

The history of ICT at the University of Dar es Salaam dates back to the early 1990's when UDSM started building up the institutional capacity for ICT through Information Technology Master Plan in line with the Institutional Transformation Program (ITP) objectives. The significance of such an initiative in mitigating the incipient digital divides between the technology rich and poor countries can not be overemphasized.

Over the years, UDSM has established a good ICT network infrastructure, it has trained some academic and technical staff who can support ICTE, and has also provided a teaching learning environment through installation of public address systems and provision of computers and other ICT facilities. However, it should also be noted that the existing facilities have not been utilized effectively to enhance teaching, learning, research and service to the community mainly because of general lack of e-literacy among the academic staff

Findings of a survey conducted by members of the newly established unit, the Instructional Technology Resource Unit (ITRU, 2002), suggest that the majority of staff members would like to be trained in the use of ICT in designing and delivering their courses through the Blackboard digital learning environment. They see some advantages in the new mode of education delivery. Such advantages include access to more, and up to date information, improvement in the teaching methodology, improvement in ICT skills, and increased flexibility in teaching and learning with regard to time and place. However, they see access to ICT facilities for staff and students as being the biggest constraint. Cheating, lazy attitudes among students, loss of skills such as reading, and creativity are mentioned as other limitations of the new mode. The academic staffs envisage that conversion of traditional materials into

online materials will take a long time. They are also concerned about protection of copyrights for the materials they will develop as well as about motivation for the extra effort that lecturers will put into developing the online courses.

According to the survey, most students think that online learning should play a role in their studies because of increased convenience and the possibility of improvement of education. They expect to become more computer literate, to be able to present their assignments in a better and more readable form, to communicate faster and search for information more easily and cheaply. They also expect to enjoy flexibility in learning the courses. However, they are concerned about lack of access to ICT facilities such as networked computers and printers, and about lack of physical contact with lecturers. Moreover, they are concerned about Americanization and westernization of their education, as well as about misuse of ICT and forgery.

On the other hand, the top management of the UDSM would like to see, over a period of five years, extensive use of ICT in education and in all other university activities. A dual mode of education delivery is envisaged, where online learning is combined with face to face learning. They suggest that staff members who put in extra effort to implement ICT in education should be motivated, largely through intrinsic forms of incentives. It is also suggested that the ITRU should be formally integrated in the structure of the UDSM, and its role should be to facilitate the development of online courses and to provide professional/pedagogical assistance to other members of staff in all Faculties.

Some faculties have established collaborative ventures with other universities such as Makerere (Uganda), Tufts (USA), and RMIT (Australia) in order to jointly design and deliver online courses and programs. ITRU is supposed to support such e learning initiatives.

*Political Science Department: Curriculum Co-Development on Regional Integration*

A concrete experience of the customization of asynchronous networks in order to enhance higher education delivery in the East African region is the CCD project. The project brings together three universities, namely the University of Dar es Salaam, (Tanzania), University of Makerere (Uganda), and Tufts University (United States). A

Political Science program PS 319: Regional Integration was jointly offered, first covering theories and concepts about regional integration. In the second phase of the course, the students put to the test the concepts and theories through a critical examination of the practice of regional integration in Europe, Africa, Latin America, North America and Asia. The activities involve weekly discussions, class assignments, reading and reviewing of documents, email correspondence among students across the digital divide, and interactive website exercises such as the virtual chat. The organizers and participants have positively evaluated the program. To quote one of the participants:

The innovativeness of the CCD project lies in the positive use of information technology to be able to bring together students and staff from Northern and Southern Universities to an interactive learning environment. This is more important because elsewhere, ICT and globalization have been known to marginalize rather than benefit the South! (Kiondo,2002).

#### *Department of Botany*

The Department's unit of Microbiology has initiated an e learning course called 'Teaching modern biotechnology through an international collaborative Blackboard supported parallel course'. This undergraduate course, which focuses on applied aspects of recombinant DNA technology, will be offered in partnership with the University of Hamline, USA, in 2003. The main features of the course include pre-course collaboration and visitation by instructors, similar course content, parallel timetable, student exchange and discussion of results through Blackboard and social interactions between American and Tanzanian students. The methodology of the course will involve practical application of recombinant DNA techniques, use of Blackboard in science learning and conducting international collaborative research. It is envisaged that the new approach to science teaching and learning, which uses technology, will raise declining interest in science subjects, and will elevate the quality to standards that are comparable internationally.

It is envisaged that the academic staff will apply the principles and skills acquired in the workshops to design online courses and will register students to take the courses on experimental basis.

In conformity to the terms of reference, six e learning instructional design workshops have so far been conducted through the Instructional Technology Resource Unit (ITRU), a sub-project within the End-user upgrade project. Ninety one academic staffs have been trained in e learning course design, to take advantage of the Technology Enhanced Independent Learning Environment (TEIL) which uses the Blackboard course delivery and management system.

The overall objective of the End-user e learning subproject was to develop a modest institutional capacity in E learning at the UDSM through activities as outlined in the Contract between the Faculty of Technology, Policy and Management (TBM) of Delft University of Technology (DUT) and the University of Dar es Salaam. In the first phase of the End-user e learning sub-project the following achievements have been made: staffing of the unit, initial training of six of the staff in e learning and instructional design, development of Trainer of Trainers e-learning course website, sensitization of academic staff about the e-learning idea, the development of individual course websites by the ITRU staff and by other trained academic staffs, as well as the establishment of ICT committees in some Faculties and Institutes.

### **Weaknesses**

However, a self evaluation and mid term evaluation (done by external evaluator) of the unit's activities suggest that, first, although the sensitized academic staffs have been motivated to develop online courses, many of the courses posted on the website are stand alone courses. There is no academic program that is fully developed and which can act as a model for other units to replicate. Secondly, the syndrome of 'old wine in new bottles' still persists among the lecturers who have attempted to design the courses. Course materials in the form of lecture notes, presentations, references, and assignments are squeezed into the digital learning environment without enforcing the new educational concepts and methods of independent learning in the design of the courses. This situation can be explained from the fact that the e-learning instructional design workshops were very short, lasting between 4 and 5 days only.

*Faculty of Science: Department of Computer Science*

A four-year e learning degree program in computer science is being launched in the Department of Computer Science under the UDSM based African Virtual University Learning Center (AVU-LC). It is a collaborative venture between the Nairobi based AVU and the Royal Melbourne Institute of Technology (RMIT) in Australia. Students will be drawn from different countries of Sub Saharan Africa. The program aims at building internal capability and expertise in ICT enhanced program delivery. It will apply the integration of satellite, Internet multimedia, live video broadcast, online tutorials and face-to-face tutorials combined with print materials and a digital library.

**The Role of ITRU**

*E Learning Instructional Design Program For Academic Staff*

The ITRU has organized a series of instructional design workshops targeting academic staff and students at the University of Dar es Salaam. The ITRU team that comprises representatives from various Faculties and University Colleges has developed web based course content for use in the training workshops. The course is made up of 9 modules which focus on the following key areas: Why e learning; Introduction to Digital Learning Environment and BlackBoard and Translating existing courses into OLL modules; Educational principles of Bb sites; Online Learning methods; Designing web based courses and setting learning goals; Transfer of Information to the WWW; E moderating and Virtual Communities; Online testing; and integration of multi-media.

The main idea behind the workshops is to encourage academic staff to enforce independent learning among the students, to sensitize them about the ability of superior methods of delivering courses, to introduce to them flexible methodologies and course design structures that recognize the needs of varied learners, to facilitate the design of electronic online materials for student access, to sensitize the staff on the need and changing roles from providers of knowledge to that of facilitators, and finally to improve student evaluation of their own learning.

According to workshop evaluation feedback obtained after every training workshop, the majority of the participants observed the need for an extended training session in order to allow more time for supervised practice. Thirdly, the experience suggests that there was limited professional support from the ITRU experts whose services were thinly spread throughout the entire university. Fourthly, feedback from lecturers who attempted to put the principles into practice by developing online courses on their own suggested that a cook book in form of a manual was required so as guide the practicing lecturer through the course development process. Fifthly, the systems administrators attached to the ITRU have not been sufficiently trained in supporting e-learning and managing the Blackboard server. This has led to over dependence on services of the UCC's overall systems administrator, which has compromised the efficiency with which the subproject has operated so far.

### **Future Plans**

It is envisaged that if ITRU gets further funding, it will taking the University of Dar es Salaam one step higher in the deployment of ICT in its primary activities of teaching and learning. More emphasis will be put on developing the institutional capacity for e learning and distance education by supporting e learning initiatives in the Faculty of Education as a pilot e learning project. The support will be in the form of conducting tailor made e-learning instructional design workshops to academic staff participating in the pilot project, producing and disseminating innovative training programmes, methodologies and materials for e learning development, and ensuring quality control of the online courses.

The major outputs of the project will include: two online bachelors programs, one online postgraduate diploma program, thirty trained academic staff, e learning course materials transformed into CD-ROMs. A key feature of the project outputs will be the development of a university-wide e-learning master plan that will provide institutional policy regarding the development of e learning.

The Faculty of Education was identified as a pilot project for the e-learning initiatives on the basis of the recent feedback from ITRU's impact assessment of its activities. The assessment indicates that the Faculty possesses a critical mass of academic staff

who have been trained as professional educators some of whom are well versed in the new concepts and theories of independent, open and distance educational principles. It is envisaged that introducing new methods to such a category of lecturers will be much easier because they have already developed the cognitive structure required to accommodate and assimilate the new methods. Secondly, the majority of the staffs in the Faculty have already been introduced to the Blackboard course. What these lecturers need are the skills for developing interactive course materials, assignments and activities for independent and collaborative synchronous and asynchronous engagement.

Thirdly, the Faculty of Education offers two academic programs that are highly marketable and which can easily attract distance education students who cannot be absorbed through the campus mode. The programs are: Bachelor of Education (B.Ed), and the Post-graduate Diploma in Education (PGDE). A recent study on the shortage of graduate teachers in the school system has revealed that there was a shortage of 8,485 graduate teachers by the year 2002. In order to address the deficit the Ministry of Education and Culture through its Teacher Education Master Plan (TEMP) aims at training about 5000 PGDE teachers in a span of 5 years. The only training institution is the Faculty of Education whose absorbing capacity is very much limited. Between 700 and 1000 qualifying Tanzanians apply into the B.Ed. program every year, but the Faculty's present capacity is 321 only. Clearly, there is a huge potential demand for online B.Ed. program. Coincidentally, the Faculty of Education has already initiated a market research for its programs in its 'ICTE and E learning Capacity Building Project for Educational Professionals' supported by the UDSM-NORAD Fund. The Faculty has also developed a proposal which aims at converting selected Education degree programmes for delivery through e-Learning.

Professional and technical support from the ITRU will be required in orienting the academic staff in e learning methodologies, in developing online courses for residential and off-campus undergraduate and post graduate students, and in developing skills for online course delivery and management.

In order to provide effective support to the Faculty of Education staff engaged in the development of online courses, ITRU will design tailor made training workshops

taking into consideration the special needs of this category of lecturers. There is also a need to research on determinants of good practice in e learning in order to develop exemplary e learning course content that can be used as demonstration of good practice.

Ensuring quality control of the online courses and programs through monitoring and evaluative research will be done on a continuous basis. As the project continues, the development of the courses will be monitored in order to ensure the quality of output. Criteria will be developed for guiding this exercise. On the basis of such criteria, ITRU will recommend new online course programs for approval by higher University organs and for replication by other academic units.

The culmination of ITRU's activities will be the development of a university-wide e-learning master plan that would enable the UDSM to deliver online higher education nation-wide using the tele-centers located in the regions upcountry. The master plan will provide institutional policy regarding the development of e learning. It will also outline the implementation phases starting with the development of online faculty programs for residential students, through redesign of the programs for distance education students, training of tele-center staff, and in the final phase the execution of off-campus study programs across the country will be effected.

### **Recommendations**

It is proposed that eLearning should be considered as an alternative strategy for addressing the acute shortage of graduate teachers in Tanzania's school system, and that the University of Dar es Salaam needs government as well as external support in building the required capacity.

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