



Integrating ICT into teaching and learning at the University of Dar es Salaam

Joel S. Mtebe , Hilary Dachi & Christina Raphael

To cite this article: Joel S. Mtebe , Hilary Dachi & Christina Raphael (2011) Integrating ICT into teaching and learning at the University of Dar es Salaam, Distance Education, 32:2, 289-294, DOI: [10.1080/01587919.2011.584854](https://doi.org/10.1080/01587919.2011.584854)

To link to this article: <http://dx.doi.org/10.1080/01587919.2011.584854>



Published online: 15 Aug 2011.



[Submit your article to this journal](#)



Article views: 245



[View related articles](#)



Citing articles: 6 [View citing articles](#)

REPORT

Integrating ICT into teaching and learning at the University of Dar es Salaam

Joel S. Mtebe^{a*}, Hilary Dachi^b and Christina Raphael^c

^a*Centre for Virtual Learning, University of Dar es Salaam, Dar es Salaam, Tanzania;*

^b*School of Education, University of Dar es Salaam, Dar es Salaam, Tanzania;* ^c*Dar es Salaam University College of Education, University of Dar es Salaam, Dar es Salaam, Tanzania*

(Received 28 October 2010; final version received 18 February 2011)

Introduction

Since 1985, Tanzania has been undergoing significant political and economic changes from a centralized to a more market-oriented and globally connected economy. The University of Dar es Salaam¹ (UDSM) has responded to these changes by reviewing its legal status, vision, and functions, particularly those related to research, teaching, and public service. UDSM's *Five-year rolling strategic plan, 2006/07–2010/11* (2006) spells out its transformative strategy and programme. The aims are to increase access to higher education, improve the quality and output of research and publications, improve the quality of teaching and learning, including curriculum design and delivery strategies, improve the number and quality of consultancy and services, and increase the number and productivity of UDSM's linkages with other institutions focusing on civic engagement and social responsibility.

This report focuses on the use of technology to improve the efficiency and effectiveness of educational processes and outcomes at UDSM and highlights one of the key lessons learned: innovations in the sphere of teaching and learning need to take cognizance of and address factors in the broader national and institutional contexts, as well as those relating to the readiness of individual staff to accept change. In other words, both first-order barriers (including access to hardware and software, technical and administrative support) and second-order barriers (i.e., those intrinsic to individuals, such as their readiness to accept change and their belief systems about teaching and technology) (Ertmer, 1999) provide challenges to access and uptake of e-learning.

Early initiatives – their strengths and limitations

Early initiatives in use of information and communications technology (ICT) and e-learning at UDSM included the introduction of the Blackboard learning management system (LMS) in 1998, the Technology Enhanced Independent Learning (TEIL) initiative funded by the Flemish Inter-University Council in 2001

*Corresponding author. Email: jmtebe@gmail.com

(see <http://www.vlir.be>), and the Advanced Level End User Competence Upgrading Project supported by the Carnegie Corporation of New York from 2004 to 2007.

Together, these projects focused on installation of network infrastructure and capacity building for core staff to provide technical support to academic staff and students. During this time, more than 2000 staff members were trained in the basics of e-learning and use of Blackboard. A total of 415 courses were created on Blackboard by March 2010 (UDSM, 2010).

By 1999, UDSM had the basic infrastructure, including an 8.2 kilometre fibre optic network connecting 28 academic buildings on the main campus, to carry out online distance education. Since then, the student halls of residence and new buildings have also been linked to the network. In addition, local area networks (LANs) have been established in all teaching and major administrative departments. By 2007/2008, almost every staff member had access to a personal computer, while every academic department had at least one computer laboratory for students. The introduction of wireless LANs (hotspots) has greatly increased student access to computing and network services.

UDSM is connected to the Internet via very small aperture terminal (VSAT) technology provided by Intelsat, which is coordinated by the African Virtual University bandwidth consortium. In 1999, the bandwidth to the Internet was increased from 512 kbps to 1.5 mbps for uplink and 7.5 mbps for downlink. In addition, UDSM is connected to the Tanzania Internet Exchange Point via the University Computing Centre to facilitate local traffic exchange.

The main server room for UDSM consists of more than 13 high-capacity servers, routers, and switches. This room is being equipped with two heavy-duty uninterruptable power supply (UPS) of 10 kVA each. UDSM also maintains several server rooms at different locations (e.g., Department of Mathematics, Administration, the Library).

The Independent Technology Resource Unit was established to coordinate these early initiatives and mandated to assist academic staff and students in the use of ICT in teaching and learning (Komba, 2005).

One of the weaknesses of these early initiatives was that they focused on motivating staff in the use of Blackboard rather than on ensuring quality teaching and learning. At that point, the focus was on use, not pedagogy. As a result, members of staff frequently merely uploaded their class notes (in forms such as PowerPoint or PDF files) for students to download. Some courses were without content or with minimal content, and most followed a one-way transmission mode of teaching and learning. The shift to more effective learning modes where students would engage critically with a range of resources and discuss their ideas, experiences, and perceptions with peers (Jonassen & Kwon, 2001; Kanuka & Anderson, 1998) was not yet part of the thinking or practice.

Although donor funding paved the way for the introduction of these early initiatives, the ongoing costs of infrastructure and staff development were beyond UDSM's limited budget. Donor funding is itself unpredictable, limited, and unsustainable.

New vision, policy, and structure

UDSM's vision on ICT, 'to become a centre of excellence in the application of ICT in teaching, learning, research, and public service by 2015' (UDSM, 2005, p. 6), set the tone for some new developments, including the development of policy

statements (e.g., the ICT master plan for 2008–2012; UDSM, 2008), strategic plans, and the establishment of the Centre for Virtual Learning in 2005.

The Centre for Virtual Learning aims to use technology to support conventional face-to-face programmes and ICT-mediated distance programmes. It has been mandated to improve the quality and flexibility of teaching and learning at UDSM and assist the schools and colleges to customize academic programmes using an open and distance electronic learning (ODEL) mode of delivery and independent learning. It is also responsible for spearheading and coordinating all ODEL activities at the university level.

Although the Centre for Virtual Learning provides for technical and didactic support for academic staff, it does not have a broader mandate to implement UDSM's vision and plans.

Migration from Blackboard to Moodle

One of the first priorities addressed and changes ushered in after the establishment of the Centre for Virtual Learning was to shift the LMS from Blackboard to Moodle, as it had become clear that the costs of licence fees for the former, previously covered by donor funding, were unaffordable for UDSM in the longer term. Through the Centre for Virtual Learning, Moodle was piloted in two distance programmes via two ODEL centres in the Mwanza and Arusha regions. Moodle can accommodate different learning styles since its applications allow for information to be presented in a variety of media formats.

Moodle was found to offer a variety of affordances for teaching and learning, with the result that a plan to expand it to all users was developed in 2008. The Educational Technology (or eLearning) Initiative of the Partnership for Higher Education in Africa (PHEA)² has provided a platform for further migration of courses and users. This initiative supports interventions to make effective use of educational technologies to address some of the underlying challenges facing higher education on the continent.

To plan for this increased effort in migration from Blackboard to Moodle, an audit was conducted to identify those courses worth migrating, that is, courses relevant to programmes and curricula, with a reasonable amount of subject content, sizable user enrolment, and high numbers of postings on discussion boards. To date, 146 courses have been identified as having potential for migration.

Capacity building and course standardization

Having learned from the shortcomings of the early initiatives, the Centre for Virtual Learning is working with staff to improve the quality of courses to be migrated to Moodle. One of the techniques used is to employ a standardized course template. This encourages staff to consider a wider variety of elements in the course as well as a wider variety of methods and resources. The elements identified in the template include:

- course code and course title
- general course introduction and list of modules
- course outcomes/objectives
- prerequisites

- course calendar
- instructor profile
- course assessment methods
- references/resources.

Importantly, a summary of the content to be covered and activities to be completed is also provided.

In addition to assisting staff in planning the course, organizing content, and setting the pace of teaching and learning, the template ensures that students receive an overview of the course and its activities at the outset, encouraging independent and flexible learning.

Prior to training being provided, many teachers did not have course content in soft copy or had content in various formats, and had not included objectives in their planning. The training encouraged teachers to consider units within courses and include a wider range of learning resources.

To date, there are about 36 standardized courses in the Post Graduate Diploma in Education (PGDE), the Post Graduate Diploma in Engineering Management, and the Master of Engineering Management (MEM). In addition, there are more than 40 courses offered in a blended mode to complement face-to-face teaching within the campus, with around 5000 students in the first semester of 2010/2011.

Teachers use discussion forums and other Moodle tools to complement their face-to-face teaching. It is anticipated that more courses will be developed and uploaded in the next few months due to the intensive training that the Centre for Virtual Learning has planned to conduct for all schools.

Challenges of ICT adoption

Despite the advances described above, UDSM continues to face a number of challenges. One of the most important of these relates to infrastructure. Although UDSM has adopted ICT as an integral part of its Institutional Transformation Programme (UDSM, 2000), a decade later there continue to be difficulties. For example, a recent evaluation of courses offered through the ODeL centres revealed that the LMS is often not easily accessible, in most cases because of poor LAN connectivity (Raphael, 2010).

Infrastructural problems are not limited to those within UDSM. Adoption of ODeL is stifled by intermittent power cuts because of load shedding. Moreover, the national electricity grid is still limited to commercially viable areas, thus bypassing most of the students in rural areas. Tanzania's Internet sector has remained underdeveloped due to the limited reach of the conventional fixed-line network and lack of international fibre connections (Materu-Behitsa & Diyamett, 2010). Many districts lie outside the reach of the national telecommunications network, and access to the Seacom fibre optic cable is currently limited to Dar es Salaam, the main commercial city in Tanzania.

Although there is a free Internet service for UDSM residential students, for the majority of ODeL students paid access is provided by the private sector in Internet cafés. Multipurpose community telecentres, offering basic telecommunications services and computer facilities designed to serve individuals and businesses, as well as to provide distance learning services, are few and far between. High retail prices for Internet services mean that downloading materials and using

discussion forums are unaffordable for the majority of ODeL students, particularly those in regions that rely on VSAT for Internet bandwidth. The same problem applies to the four ODeL centres located in the Dodoma, Mwanza, Mbeya, and Arusha regions.

A second critical issue in ensuring uptake of new technologies for teaching and learning is that of staff members' mindsets, or what Lei and Morrow (2010) refer to as 'adoption of technology innovation into pedagogical practices' (p. 143). Despite the early initiatives described above and the establishment of the Centre for Virtual Learning, the majority of staff at UDSM have not adopted e-learning or integrated the use of new technologies into their work. It would appear that the necessary paradigm shift has not taken place. Conventional modes of course delivery with teacher-centred didactic strategies continue in almost all departments.

Although the Centre for Virtual Learning has promised financial incentives to staff engaged in developing new e-learning content, this strategy has had limited success. E-learning materials have not been posted on time, CDs have been submitted late, and inconsistencies have been found between materials on the LMS and those on CDs.

Although the introduction of standardized course design approaches, as described in this report, has been an important step forward at UDSM in ensuring that lecturers and students are on the same page when thinking about learning content and activities, further work is required to ensure that the full potential of e-pedagogy is used. Greater levels of staff–student and student–student engagement and e-research through the use of wikis and other tools will not only encourage the development of new skills, but also better prepare our graduates for the world of work.

In addition, plans are in place for the implementation of appropriate monitoring and evaluation mechanisms to create feedback loops that will inform the design and delivery of courses on an ongoing basis. It is also hoped that research will be conducted to ensure that UDSM develops a high level of expertise and is able to make decisions based on sound evidence.

Conclusion

Reflection on changes made, decisions taken, and processes followed since UDSM first engaged with educational technologies suggests that these innovations need to be embedded within a broader framework of educational reforms aimed at bringing about a new culture of learning and teaching (Khefoon & Brush, 2007). Innovations need to take into account both first-order and second-order barriers. The various challenges underlying the adoption of educational technologies at UDSM interweave in complex ways and, in order to be fully understood, need to be carefully documented, traced, and analysed over a period of years.

Notes on contributors

Joel S. Mtebe is an assistant lecturer and coordinator for virtual learning technologies at the Centre for Virtual Learning.

Hilary Dachi is a senior lecturer in the School of Education.

Christina Raphael is an assistant lecturer, and is currently studying for a PhD with University College Dublin.

Notes

1. UDSM was first established in 1961 as a College of the University of London. In 1963 it became a Constituent College of the University of East Africa and then, in August 1970, it became a national university.
2. This is a joint project of the Carnegie Corporation of New York, the Ford Foundation, the MacArthur Foundation, the Rockefeller Foundation, and the Kresge Foundation.

References

- Ertmer, P. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47–61. doi: 10.1007/BF 02299597
- Jonassen, D.H., & Kwon, H.I. (2001). Communication patterns in computer-mediated and face- to-face group problem-solving. *Educational Technology Research and Development*, 49(1), 35–51. doi: 10.1007/BF 02504505
- Kanuka, H., & Anderson, T. (1998). Online social interchange, discord, and knowledge construction. *Journal of Distance Education*, 13, 57–74. Retrieved from <http://www.jofde.ca/index.php/jde>
- Khefoon, H., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55, 223–252. doi: 10.1007/s11423-006-9022-5
- Komba, W.L.M. (2005). Challenges and opportunities for implementing open and distance learning at the University of Dar es Salaam. In *Proceedings of the 12th Annual Consultative Meeting on the UDSM ITP* (pp. 137–152). Dar es Salaam: Directorate of Planning and Development.
- Lei, J., & Morrow, B. (2010). Teachers' adoption of technology innovation into pedagogical practices. *Education Information Technology*, 15, 143–153. doi: 10.1007/s10639-009-9101-4
- Materu-Behitsa, M.M., & Diyamett, B.D. (2010). *Tanzania ICT sector performance review 2009/10* (Policy Paper No. 11). African Technology Policy Studies Network, Tanzania Chapter. Retrieved from http://www.researchictafrica.net/publications/ICT_Sector_Performance_Reviews_2010/Vol%202%20Paper%2011%20-%20Tanzania%20ICT%20Sector%20Performance%20Review%202010.pdf
- Raphael, C. (2010). *Evaluation of ICT mediated courses offered via Arusha and Mwanza ODeL centres*. Dar es Salaam: University of Dar es Salaam.
- University of Dar es Salaam (UDSM) (2000). *Institutional transformation program, University of Dar es Salaam*. Dar es Salaam: Author.
- University of Dar es Salaam (UDSM). (2005). *UDSM ICT master plan 2005*. Dar es Salaam: Author.
- University of Dar es Salaam (UDSM), (2006). *Five-year rolling strategic plan (2006/07-2010/11)* University of Dar es Salaam. Dar es Salaam: Author.
- University of Dar es Salaam (UDSM). (2008). *Information and communication technology master plan (2008-2012)*. Dar es Salaam: Author.
- University of Dar es Salaam (UDSM), (2010). *Status of e-learning courses: The audit report*. Dar es Salaam: Centre for Virtual Learning.