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A SWOT analysis of the integration of e-learning at a university in Uganda and a university in Tanzania

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This research examines the strengths, weaknesses, opportunities and threats (SWOT) to integrating e-learning perceived by academic staff at a university in Uganda and a university in Tanzania. Mixed-methods research was used in which a main qualitative study was complemented by a quantitative method. The sample participants were academic staff from Mountains of the Moon University in Uganda ($n = 20$) and Mzumbe University in Tanzania ($n = 20$). The SWOTs from three aspects are analysed: institution-related, instruction-related and investment-related aspects. The results show that at both universities the institutions and teachers understand the need to integrate e-learning, which provides strengths and opportunities for the universities; however, the lack of capacities in terms of institutional policies, teacher competences and internal investment constitutes the weaknesses and threats for the universities.

Keywords: e-learning; SWOT; Tanzania; Uganda; perceptions; academic staff

1. Introduction

E-learning is becoming an increasingly important element in teaching and learning at universities in sub-Saharan Africa. While e-learning platforms are available in many tertiary institutions in Africa, the adoption of the technology is quite different from country to country and from institution to institution (Eke, 2011). The available infrastructure, willingness of leadership support and competences of staff are very important factors, among other influencing factors (Chigona & Dagada, 2011). In developing countries, e-learning is still in its infancy and early adoption stage, and the countries experience challenges which are different from those in developed countries (Bhuasiri, Xaymoungkhoun, Zo, Jeung, & Ciganek, 2011).

Research shows that the use of Information Communication Technology (ICT) at all levels of education can be a catalyst for improving access to quality education (Morawaczynski & Ngwenyama, 2007). The use of technology in and for education is seen worldwide both as a necessity and as an opportunity (UNESCO, 2009). The use of ICT in education promotes e-learning and provides new and innovative means to bring educational opportunities to a greater number of people of all ages (UNESCO, 2009). Previous studies also indicate that e-learning can relax the constraints of face-to-face learning, such as room size and student/teacher ratios (Kurt & Larchin, 2005). The European Commission (EC, 2008) stated that ICT is fostering a growing internationalisation of higher education, where networking is

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enabling shared courses. This can be extremely important for African higher education institutions as the lack of learning material and resources is a major challenge in this continent.

Successful integration of ICT is to a large extent influenced by the competences of the stakeholders (e.g. students, teachers and leaders). Teachers in the twenty-first century are faced with the challenge of having to update their knowledge to make appropriate use of ICT (Anouk, Bart, & Nyaga, 2005). Previous research points out that underdeveloped countries such as Tanzania and Uganda still need to adopt and apply e-learning more widely in education (Zemsky & Massy, 2004).

In Uganda, e-learning has been adopted in some higher education institutions, but there are challenges that account for the low adoption rates, abandonment and failure of some e-learning projects. Mountains of the Moon University was established in the Albertine region of Uganda in 2005 with the main objectives of providing quality education, providing areas of study that are vital to the social, moral and economic development of the region and beyond, promotion of research and producing independent-minded, conscious and responsible individuals. However, the university is facing great challenges with limited classroom space, as well as applying the use of modern technology in teaching and learning. The university is considering the implementation of e-learning for some courses or programmes so the students can follow the courses from a distance and engage in a dynamic learning process and knowledge construction through e-learning. It is against this background that the need to develop e-learning becomes especially relevant. Under the support of a VLIR-UOS project (supported by the Flemish Interuniversity Council of Flanders, Belgium), the university has started to train and involve teachers to develop and design e-learning for distance education programmes for the university.

In Tanzania, Mzumbe University in the Morogoro region is facing similar challenges. The university is situated in a rural region. For some programmes, part-time students do not stay on campus and therefore travelling to the campus for courses becomes a major challenge. The need to develop e-learning becomes an important way to counter these difficulties, especially because the ICT infrastructure of the university has developed very quickly owing to a VLIR-UOS project which has provided the hardware and network possibilities to develop ICT-supported distance learning.

1.1. E-learning

E-learning can be defined as ‘learning facilitated online through network technologies’, which denotes ‘information and communications technology enhanced learning by delivering learning contexts and activities via internet, intranet/extranet, audio/video i.e. via an environment consisting of hardware, software and personnel’ (Keller, Lindh, & Hrastinski, 2007, p. 33). In this study, e-learning refers specifically to the use of the Moodle e-learning platform for teaching and learning. It includes both on-campus and off-campus use of the e-learning platform for teaching and learning. The Moodle platform supports teachers and students with learning content, learning activities and communications with convenience and ease (Amandu, Muliira, & Fronda, 2013; Henderson, 2005; Kavaliauskierie, 2011). The implementation of e-learning relies on many factors including computer and Internet availability and accessibility, especially in developing counties such as Uganda and Tanzania. Internet speed and reliable access are also critical factors in this context (Othman & Musa, 2012).

1.2. The situation of e-learning in Uganda and Tanzania

Developing e-learning in this region is facing several challenges (Nihuka, 2011). At the case university in Uganda, the use of ICT for education is quite limited, being mainly the use of PowerPoint presentations in lecture rooms and sending emails to students with teaching material or assignments. There are also major challenges with regard to infrastructure as well as teachers' pedagogical skills in developing e-learning (Mpofu, 2012, cited in Nyerere, Gravenir, & Mse, 2012). Although challenges for e-learning have been studied in the African context (Sikwibele & Mungoo, 2009, cited in Nyerere et al., 2012), there is currently no available research on what specific challenges, strengths or weaknesses these regions have for developing e-learning. Though the challenges can be overcome by the provision of Internet connectivity, more insights are needed in order to understand the specific strengths, opportunities, weaknesses and threats in rural areas in Africa, in particular in Uganda and Tanzania.

In Tanzania, Ndume, Tilya, and Twaakyondo (2008) noted that implementing e-learning faces challenges such as management support, methodology, technology, resource accessibility and availability, culture of education and learning styles, design of assistive tools, intellectual investment and global business. They noted that obstacles to e-learning in Tanzania include factors such as a disruptive power supply arising from unstable power in the country. The study suggests that, owing to e-learning's unpopularity, implementing it requires a step-by-step approach so that learners can slowly familiarise themselves with this style of learning. Power and affordable Internet connectivity have played a big role in the digital divide between the rural and urban areas in Tanzania and Uganda, and this poses a major challenge to the development of e-learning.

However, there is potential in the development of e-learning in the two countries because there is a strong will from the national and institutional leadership to push it into operation. Tanzania's national ICT policy (MOIT, 2003, cited in Kalinga, 2008) has among its objectives the use of ICT in improving the quality of delivery of education and training. In the case of Uganda, the national ICT draft policy (Ministry of Information and Communication Technology, 2012) fully supports the implementation of e-learning in the country and expects e-learning to promote the economic growth of the country (Kahiigi, Ekenberg, Hanson, Danielson, & Tusubira, 2008). The use of ICT for education is included in the strategic plan of the two universities in this study.

1.3. The need to develop e-learning in Tanzania and Uganda

Many countries in the developing world are looking into the possibilities of moving from traditional teaching methodologies to more innovative student-centred, self-directed learning by learners. Students have an increasing need for flexible ways of learning in which the use of modern technologies in teaching and learning cannot be avoided. Many students would like to study and keep their employment or even seek employment while studying. Practices and research have shown that adopting e-learning may be able to meet students' needs if they cannot be on campus regularly.

1.4. Capacity building in terms of the integration of e-learning

There is a crucial need for capacity building in terms of the use of ICT for education and the implementation of e-learning in the universities involved in this study. In

this research, we focus on three key aspects of capacity building for e-learning: institution-related, instruction-related and investment-related aspects.

With regard to institution-related aspects, relevant policies and management support (leadership) play an important role. Leadership at multiple levels is a significant element of capacity building in order to sustain and transform teaching and learning. In addition, capacity building regarding development of enabling infrastructure and equipping teachers and instructors is a definite need.

With regard to instruction-related aspects, teacher and staff competences in designing and implementing e-learning are crucial. More specifically, teacher competences need to be optimised in two major aspects: pedagogical competences and the capacity in using educational technology. The capacity building of teachers should not be restricted to improving their ICT skills, but more importantly be focused on the potential of ICT to build teachers' professional competences to enhance the quality of instruction.

With regard to investment-related aspects, it is important that the educational institutions select the most appropriate technologies or the mix of appropriate technologies. The educational institutions need to have a good understanding of the needs and affordability, and therefore make informed decisions. Furthermore, large-scale applicability of e-learning depends on the costs of acquisition and operation of different technologies.

1.5. SWOT analysis

SWOT stands for 'strengths weaknesses opportunities threats'. It is a standard brainstorming and communication technique used to identify issues associated with changes. The needs can be related to the characteristics, concerns and potential constraints for the students, teachers, and any other relevant stakeholders and factors (Gilb & Finzi, 1988). The SWOT analysis on e-learning can give us a good understanding of the strong and weak points, the opportunities e-learning can bring and the threats that it may face.

SWOT analyses have been widely used in analysing situations in business and organisations, such as business plans, strategic partnerships and personal career development. They have also been used in educational settings for strategic planning and decision making. As the deployment of e-learning in the two case universities still needs university strategic planning and decision making, a SWOT analysis can be a very important tool to analyse the situation and perceptions of stakeholders. In this study, we focus on a SWOT analysis at the two case universities in order to identify the needs, and perceived strengths and constraints regarding the implementation of e-learning at the institutions. This study focuses on the needs and perceptions of academic staff, who are the direct actors in implementing e-learning in their daily educational practices. The results can lay a basis for relevant university policies for deploying e-learning and relevant training for academic staff.

2. The research questions

The research questions of this study are two-fold:

- RQ1: What is the current status of e-learning, the experience, perceived readiness and the self-perceived skills of the academic staff for implementing e-learning at the two case universities in Uganda and Tanzania?

- RQ2: What are the strengths, weaknesses, opportunities and threats (SWOT) perceived by the academic staff regarding the implementation of e-learning at the two case universities in Uganda and Tanzania?

3. Research method

3.1. Research design and procedure

Mixed-methods research is used in which a main qualitative study is complemented by a quantitative method. The mixed-methods approach is suitable for this study. The qualitative and quantitative data are complementary to each other in order to provide deeper understanding of the issues. This research focuses on the two case universities, one in Uganda and one in Tanzania. For each setting, focus groups were organised with 20 academic staff in order to identify their perceptions about e-learning, perceived challenges, opportunities etc. During the focus groups, teachers were first asked to complete a short survey to report the current status of e-learning, perceived readiness, and their own skills and experience in e-learning. The participants were also asked to respond to the open questions with regard to the SWOT in integrating e-learning and individually write down their views and perceptions. After the survey was completed, focus group discussions took place. The participants were asked to discuss their perceptions of the SWOT of integrating and implementing e-learning for their courses or programmes, their perceived advantages and shortcomings, the skills and attitudes of the teaching staff and management, as well as the factors that can influence the implementation of e-learning. Each group had a moderator and a note taker who facilitated the discussions and noted down all the discussions. Both data from the survey (including the open questions on SWOT) and the transcripts from the focus group discussions were used for data analysis.

3.2. Instrument

The survey included questions regarding the academic staff's own experience with e-learning, their attitudes, self-perceived computer skills and e-learning skills, and the situation of the university related to e-learning (such as infrastructure, university policy, staff capacity) with a total of 19 items, and four open questions with regard to SWOT for e-learning. For the structured questions, a Likert scale of 1–6 was used. The demographic information of the participants (age, gender, subject of teaching, years of teaching) was also elicited. The focus group guiding questions were constructed to guide all the focus group discussions.

3.3. Participants

At Mzumbe University (MzU) in Tanzania, 20 teachers from five faculties (eight departments) participated in this study. The teachers had an average age of 37 (age range from 27 to 50). Among them, 8 were female and 12 were male teachers. The participants were invited by the university administration and the VLIR project coordination office. The invitation was sent to the academic staff of all the faculties and participation was voluntary. As all the faculties have similar situations regarding e-learning, there was no specific pre-selection of faculties or departments. At MzU, the e-learning platform (Moodle) is available for all faculties. All faculty members

Table 1. Description of the study participants.

Participants	MzU, Tanzania	MMU, Uganda
Female	8	7
Male	12	13
Age range	27–50	26–58
Average age	37 ($SD = 6.62$)	43 ($SD = 15.48$)
Disciplines	Education, Social Sciences, Business Studies, ICT, Law, Science and Technology, Administrative Studies, Development Studies	Education, Public Health, Informatics and Computing

are free to choose to use the e-learning platform to support their teaching and learning.

At Mountains of the Moon University (MMU) in Uganda, 20 teachers from three out of five faculties of the university participated in this study. The three faculties were Health Sciences, Informatics and Computing, and Education. The average age of the teachers was 43 (age range from 26 to 58). Among them, 7 were female and 13 were male teachers. The participants were invited by the university administration and the VLIR project coordination office. The participation was voluntary. The university is in the process of setting up Moodle as the e-learning platform.

Information about the participants is presented in Table 1.

3.4. Data analysis

The data from the short survey were analysed by the software SPSS and the focus group data were analysed using MAXQDA software. First of all, the data collected through the survey were used mainly for descriptive analyses. The reliability analysis of scales was conducted and the reliability of all scales was confirmed with Cronbach's alpha higher than .70. As the samples were small, non-parametric methods were used for statistical analysis. Secondly, the participants' responses to the open questions in the survey and the focus group discussions were transcribed for analyses. The qualitative data were entered and analysed using MAXQDA. First, deductive coding strategies were used to derive meanings from the participants. More specifically, two coding methods are used in MAXQDA, free coding and in-vivo coding. Free coding is the typical style of initial coding in which a new code is attached to a text passage. In-vivo coding is used when words or terms of the interviewees are taken as codes. Secondly, thematic coding was used to generate the main concepts or categories of ideas that were mentioned by the respondents. The qualitative data were analysed by two researchers. The inter-rater consistency of the two coders reached .87. The rest was discussed and agreed upon by the coders.

4. Results

4.1. Participants' responses regarding infrastructure, perceived skills, attitudes and perceived readiness for e-learning

First of all, the respondents reported on their access to computers and the Internet on campus and at home. The results show that the respondents from MzU had much easier access to computers and the Internet both on campus and at home than

participants from MMU. The Mann–Whitney U tests show that the differences were significant, because MzU scored much higher than MMU. The difference was especially large with regard to Internet access at home, where the teachers at MzU had much easier access at home than the staff at MMU.

With regard to self-perceived skills, the staff from both universities rated their own computer skills and skills to use the Internet at a good level (means between 4.53 and 4.71 on a 6-point Likert scale). However, the staff from both universities rated their skills to use technology (in the classroom) for teaching and learning at a low level (Mean_{MzU} = 2.11, *SD* = .67 and Mean_{MMU} = 2.15, *SD* = .66).

With regard to perceived status and readiness for e-learning, the staff of MzU reported a moderate level of university infrastructure for e-learning (mean = 3.33, *SD* = .54), a high level of university policy and strategy to support e-learning (mean = 4.50, *SD* = .87), a reliable, available university e-learning platform to support e-learning (mean = 4.17, *SD* = .56) and available staff to support e-learning (mean = 3.28, *SD* = .97). The perceived status and readiness for e-learning at MMU seemed to be less positive. The staff of MMU reported a limited university infrastructure for e-learning (mean = 2.23, *SD* = .58), a rather limited university policy and strategy to support e-learning (mean = 2.54, *SD* = .71), low readiness of the university e-learning platform to support e-learning (mean = 2.17, *SD* = .73) and also a low level of available staff capacity to support e-learning (mean = 2.57, *SD* = .49). In addition, the staff from both universities reported their own knowledge and skills to implement e-learning (using e-learning platforms such as Moodle) as low (means between 2.46 and 3.00).

With regard to staff attitudes towards e-learning, the academic staff of both universities reported high interest in implementing e-learning (Mean_{MzU} = 5.82, *SD* = .78; Mean_{MMU} = 5.69, *SD* = .81), high willingness to implement e-learning (Mean_{MzU} = 6.00, *SD* = .80; Mean_{MMU} = 5.77, *SD* = .82), high level of perceived usefulness of e-learning (Mean_{MzU} = 5.10, *SD* = .72; Mean_{MMU} = 4.87, *SD* = .71), and a positive intention to use e-learning (Mean_{MzU} = 5.20, *SD* = .59; Mean_{MMU} = 4.91, *SD* = .90).

Given the specific context and situation, next to developing e-learning using computers and the Internet, the respondents were also asked to rate the feasibility of e-learning through radio. Both universities rated the feasibility of e-learning using computers and the Internet positively (Mean_{MzU} = 4.71, *SD* = .58; Mean_{MMU} = 4.84, *SD* = .87), and rated the feasibility of e-learning through radio moderately (Mean_{MzU} = 2.88, *SD* = .66; Mean_{MMU} = 3.08, *SD* = .54). The results of the participants' responses to the survey were summarised in Table 2.

4.2. SWOT analysis

Based on the answers of the respondents to the open questions and the transcripts from the focus group discussions, SWOT analyses of implementing e-learning at the two universities were conducted. The summaries of the SWOT analyses of MzU and MMU are presented in Table 3 and Table 4 respectively.

4.2.1. SWOT analysis of MzU in Tanzania

Perceived strengths. Regarding perceived strengths to implement e-learning, the staff of MzU report nine main strengths. First, the top management of the university is

Table 2. Participants' responses regarding infrastructure, perceived skills, readiness and attitudes towards e-learning.

	MzU Mean (<i>SD</i>)	MMU Mean (<i>SD</i>)
Infrastructure (0 = no access, 6 = very easy access)		
- computer access on campus	4.47 (1.80)	4.31 (1.51)
- computer access at home	4.89 (1.61)	3.00 (2.31)
- Internet access on campus	3.44 (1.62)	3.03 (1.26)
- Internet access at home	3.56 (1.85)	1.65 (1.35)
Perceived skills (1 = not skilled, 6 = very skilled)		
- self-perceived computer skills	4.53 (1.23)	4.64 (1.33)
- skills in using the Internet	4.60 (1.20)	4.71 (1.26)
- skills in using technology for teaching and learning	2.11 (1.62)	2.15 (2.00)
Perceived readiness for e-learning (0 = nothing at all, 1 = very limited, 6 = very good)		
- university infrastructure for e-learning	3.33 (1.32)	2.23 (1.42)
- university policy and strategy to support e-learning	4.50 (1.21)	2.54 (1.55)
- university e-learning platform to support e-learning	4.17 (1.15)	2.17 (1.90)
- university staff capacity (available personnel) to support e-learning	3.28 (1.40)	2.57 (1.34)
- your knowledge of e-learning	2.95 (1.57)	3.00 (1.81)
- your skills in implementing e-learning	2.71 (1.44)	2.46 (1.69)
Attitudes towards e-learning (0 = not at all, 1 = a little bit, 6 = very much)		
- interest in implementing e-learning	5.82 (.53)	5.69 (.85)
- willingness to implement e-learning	6.00 (.00)	5.77 (.85)
- perceived usefulness of e-learning	5.10 (.89)	4.87 (.95)
- intention of using e-learning	5.20 (.87)	4.91 (.77)
e-learning channels (1 = very unlikely, 6 = very likely)		
- feasibility of e-learning through computer and Internet	4.71 (1.35)	4.84 (1.15)
- feasibility of e-learning through radio	2.88 (1.83)	3.08 (1.84)

highly committed to implementing e-learning. Several respondents indicate that 'the top management is committed to e-learning initiatives'. Secondly, the respondents report that there is an increasing availability of computers, Internet access and wireless access on campus. This provides a sound basis for developing e-learning at MzU. In addition, there is an e-learning platform available and competent IT staff to maintain and upgrade the e-learning systems. It is reported that a large group of staff is quite willing and motivated to use e-learning. The respondents also mention that most staff members have basic ICT skills to use ICT in education. Very importantly, the staff also comment that most students have the ICT skills and are ready to adopt e-learning. Furthermore, the university is ready to invest in e-learning and there is support from the VLIR project funding and other funding sources. The increased Internet access on the other campuses of MzU is also helpful for students to access e-learning from different campuses or locations. All these elements are reported as strengths of the university for adopting and implementing e-learning.

Perceived opportunities. Regarding the opportunities of e-learning, most of the staff state that e-learning can serve many students in a more efficient way; and e-learning can reach a wide range of members in the community. Most staff report that

Table 3. SWOT analysis for e-learning at MzU.

Strengths	Weaknesses
Institution-related	Institution-related
(1) Top management commitment for implementing e-learning	(1) Absence of university policy on e-learning
(2) Available computers, Internet and increased wireless access points	(2) Inadequacy of computers, PCs and Internet access for students and limited facilities per staff; unstable Internet connectivity and insufficient bandwidth
(3) Availability of the e-learning platform	(3) Limited support to e-learning for staff and students
(4) Internet access on other campuses is increasing	Instruction-related
Instruction-related	(4) Limited competences (knowledge, skills...) of staff and lack of training for staff for e-learning, e.g. limited capacity of staff to develop e-learning material or design
(5) Competence of IT staff	(5) Resistance of some staff to adopt change and new technology
(6) Willingness and commitment from a large group of staff	(6) Lack of commitment among staff and students to use e-learning in the teaching and learning processes
(7) Basic IT skills of most of staff and students	(7) Lack of student competences, e.g. some freshmen students lack computer knowledge
(8) Readiness of most students to adopt e-learning	(8) Lack of awareness, motivation and incentives to implement e-learning
Investment-related	(9) Lack of plagiarism tools to monitor the quality of student assignments
(9) University readiness to invest in e-learning and support of project funding	Investment-related
	(10) Constraints in resources
Opportunities	Threats
Institution-related	Institution-related
(1) Management support	(1) Lack of institutional support; current policy or regulation may be in conflict of e-learning; e.g. classroom attendance
(2) Serving many students in a short time	(2) Fluctuation of Internet connectivity
(3) Wide reach of members in the community	(3) Limited e-learning facilities and training
(4) Availability of skilled personnel	(4) Challenges of new technologies
(5) Saving time, faster communication to students	Instruction-related (including social and culture-related)
(6) In line with university expansion plans and the growing trend towards e-learning adoption	(5) Cultural issues and habits, e.g. favouring face-to-face communication pattern and lecture style of teaching
Instruction-related	(6) Risk of reduced face-to-face social interactions
(7) Willingness to learn of staff and students	
(8) Participation of student from a distance; accessible way of learning regardless of location	

(Continued)

Table 3. (Continued).

Opportunities		Threats	
(9)	Enhance teaching and learning interaction (among teachers and students)	(7)	Resistance to change of some staff
(10)	Communication in online forum can increase the participation of some students, e.g. shy students	(8)	Lack of seriousness and self-regulation among students, e.g. when surfing the Internet
(11)	The assignments can be creative	(9)	Little monitoring of student assignments in e-learning
Investment-related		(10)	Higher workload
(12)	Available funding resources from external agencies	Investment-related	
		(11)	Financial constraints

e-learning is efficient at delivering learning materials within a short time, can save time and provide fast communication to students. It has the advantage of providing access to students from both on campus and at a distance. It also has the advantage of facilitating interaction among students and between teachers and students. Most of the respondents mention that e-learning can enhance the efficiency and effectiveness of the teaching and learning process. Some teachers point out that communication in the online forum can help the participation of those students who are shy in face-to-face settings. In addition, teachers can give more creative and constructive assignments to students using e-learning. Furthermore, the development of e-learning is in line with the university's expansion strategies to reach more students by adopting e-learning.

Perceived weaknesses. The respondents report that although the top management is highly committed, there is a lack of institutional policy for implementing e-learning. Another important weakness is that there is limited staff capacity to implement e-learning and to develop e-learning material. Staff competence is an especially critical issue. Although some teaching staff may be familiar with technology in general, they may still lack the competences and experience to integrate e-learning into their course delivery. All respondents report a need for training to enhance staff competence in developing and using e-learning. It is also pointed out that the computers available are limited in terms of the ratio of PCs per student. Limited ICT equipment and an unreliable Internet connection are also considered weaknesses for using e-learning. In addition, there is limited support available for staff and students to engage in e-learning. Moreover, some staff members are resistant or reluctant to adopt changes, especially some senior lecturers. There is also a lack of commitment among students to use ICT for learning processes, as well as some students lacking the basic computer skills to engage in e-learning, for example some freshmen from rural regions have no prior computer knowledge. The lack of motivation and incentives to implement e-learning is also reported by some staff as a weakness.

Perceived threats. MzU staff perceive a number of threats. The first threat or barrier mentioned by the staff is that there exists a tradition of favouring face-to-face communication or oral communication, which might not be in line with e-learning. In addition, many teachers are used to the tradition of lecturing in the classroom and using the transmission mode of teaching. Secondly, the staff report that the current

Table 4. SWOT analysis for e-learning of MMU in Uganda.

Strengths	Weaknesses
<p>Institution-related</p> <p>(1) Willingness from administration and leaders</p> <p>(2) Computer availability for students in computer rooms</p> <p>(3) Possibility to deploy e-learning at outreach community centres</p> <p>Instruction-related</p> <p>(4) Staff willingness to use e-learning</p> <p>(5) Basic ICT skills available among staff members</p> <p>(6) Most MMU distance learners (such as working students) have access to computers</p> <p>(7) Possibility to reuse existing resources for developing e-learning content</p> <p>(8) Possibility to deploy mobile learning as everyone has a mobile phone</p> <p>Investment-related</p> <p>(9) Available external support from e-learning specialists</p>	<p>Institution-related</p> <p>(1) Absence of an institutional e-learning policy</p> <p>(2) Absence of an up-to date e-learning platform</p> <p>(3) Insufficient numbers of PCs per student and per staff</p> <p>(4) Limited facilities and access to Internet</p> <p>(5) Low bandwidth and unstable Internet</p> <p>Instruction-related</p> <p>(6) Limited knowledge and insufficient skills among some staff and students to use e-learning</p> <p>(7) No sufficient or up-to-date learning materials; lack of quality learning material</p> <p>(8) Passive learning culture, students are used to spoon-feeding; not used to deep learning</p> <p>(9) Some distance students are in rural areas and have limited access to computers and the Internet</p> <p>Investment-related</p> <p>(10) Limited resources and funds</p>
Opportunities	Threats
<p>Institution-related</p> <p>(1) The outreach centres can serve as e-learning centres for the community</p> <p>(2) Internet connection and bandwidth is being improved/ upgraded</p> <p>Instruction-related</p> <p>(3) High need for e-learning as 60% of student population are distance learners (not on campus) and 40% are campus students</p> <p>(4) Most of the distance students are working students and have access to computers and the Internet; most of them in urban areas</p> <p>Investment-related</p> <p>(5) External support for staff training available to develop staff knowledge and skills regarding e-learning</p> <p>(6) External support for additional PCs for students and laptops for staff</p> <p>(7) External support for developing radio and digital radio as an e-learning channel</p>	<p>Institution-related</p> <p>(1) Politics can have an influence on university policy</p> <p>(2) Unreliable power supply</p> <p>(3) A large group of old staff</p> <p>(4) Poverty in the community</p> <p>Instruction-related (including social and culture-related)</p> <p>(5) Negative attitudes of some staff and students towards new technology/ICT</p> <p>(6) Very limited available staff capacity to implement e-learning</p> <p>(7) Negative attitudes of some students toward learning; weak motivation to learn; lack of intrinsic motivation of students; end goal is to get a diploma</p> <p>(8) Heavy workload at home and at the workplace for staff; Heavy workloads for students when combining different roles</p> <p>Investment-related</p> <p>(9) Relying on external support and budget</p>

policy or regulations may be in conflict with using e-learning. For example, students' attendance in class is required by university regulations. There is also a concern from staff that students would not focus on learning when surfing online and there is some doubt about student seriousness and self-regulation when learning online. Some teachers indicate that there is little monitoring when students are completing assignments in e-learning, for example, students can copy easily from others. Some teachers are also worried about reduced face-to-face social interactions in e-learning. The resistance to change of some staff is also considered as a threat or barrier to using e-learning. Higher workload of teachers and students is regarded as another threat, as reported by some teachers. In addition, some teachers report that the fluctuation or instability of Internet connectivity, and the current limited e-learning facilities as well as lack of staff training are threats for the university in adopting e-learning.

Channels for e-learning. Computers and the Internet are perceived as the most important channels for e-learning. About one-quarter of the respondents also mentioned that radio can be a useful channel for e-learning. In addition, during the group discussions several staff also pointed out that mobile phones can be useful e-learning tools.

4.2.2. SWOT analysis of MMU in Uganda

Perceived strengths. The staff of MMU report nine main strengths of the university for integrating e-learning. Similar to MZU, MMU staff consider that the willingness and support from leaders and administration is very important. Secondly, the willingness of most staff to implement e-learning is a strength of the university. The participants report that most staff members have basic ICT skills. In addition, thanks to external support for ICT equipment, there are computers available for students in the computer rooms on campus. With regard to the MMU distance students, as they are mostly working students most of them have access to computers and the Internet. The above conditions have lowered the barriers to implementing e-learning regarding infrastructure and access. The participants also report a strength in some faculties where the teachers can develop the e-learning content based on existing learning material, for example through digitalising some of the existing learning material in printed format. The external support and guidance from e-learning specialists under the framework of the VLIR project is also a strength that can contribute to the e-learning development at MMU. The VLIR project provides support for capacity building at the outreach community centres, which enhances the possibility to deploy e-learning at the outreach centres. Furthermore, it is also possible to develop mobile learning through mobile phones as everyone has a mobile phone.

Perceived opportunities. Some of the strengths mentioned above are also mentioned by the participants as opportunities for developing e-learning. The external support, including the staff training on professional development of staff competences for using e-learning, is a great opportunity for the university. The improvement of the outreach centres is considered an opportunity to enhance the e-learning provision of the university for the community people through the outreach centres. The enhanced Internet connection and bandwidth provide better opportunities to develop e-learning. The external support and training on developing radio programmes also

provides opportunities to use radio as an e-learning channel for MMU and its community. It is expected that additional PCs for students and laptops for staff will be sponsored by various organisations in the coming years. Another unique opportunity for MMU to develop e-learning is that 60% of the students of MMU are distance learners (not on campus) and 40% are campus students. Most of the distance students are working students and have access to computers and the Internet. This shows a need as well as a feasibility for the use of e-learning for MMU students.

Perceived weaknesses. Limited resources and funds are considered a weakness of MMU. There is also insufficient numbers of PCs per student and per staff (only a small proportion of staff members have laptops). Most of the staff and students have limited knowledge and insufficient skills to use e-learning. The current facilities and access to the Internet are also limited with low bandwidth and unreliable Internet connections. For some distance students who are in rural areas with limited access to computers and the Internet, it is a big challenge to access e-learning. Another weakness is that there is a lack of up-to-date and quality learning materials. Currently there is also no institutional e-learning policy at MMU. Another weakness is that students are used to passive learning and spoon-feeding, and not used to deep learning. This seems to be a common issue or weakness both at the MzU and MMU.

Perceived threats. The biggest threat for MMU and the surrounding areas is the unreliable power supply. To guarantee the function of the university, external donors are sponsoring power generators in order to maintain the normal function of the university on campus and the outreach centres. This can be a threat for e-learning as it is supported by external financing (donors). The participants report that another challenge is the age of the staff, as a large group of the teachers are older than 45. A common challenge or threat regarding the involvement of teachers and students in new learning methods is related to the heavy workloads at home and at the workplace for staff, and the heavy workloads for students who often have to combine different roles in their lives. As reported in the short survey and during the focus group discussions, very few staff have prior experience in e-learning and therefore have very limited competence in implementing e-learning. Some staff and students have negative attitudes towards new technology and ICT and would prefer the traditional ways of teaching and listening in the classroom. The respondents from MMU also report that their students lack intrinsic motivation to learn and the end goal is to get a diploma. Furthermore, it is a challenge for the university as its development plan relies heavily on external support and budgets.

Channels for e-learning. Computers and the Internet are perceived as an important channel for e-learning. About half of the respondents mention that radio can be a useful channel for e-learning. Most of the staff agree that the availability of mobile phones can be a useful channel too for e-learning.

Discussion

The results of the descriptive analysis and the SWOT analysis show that there are both similarities and specific characteristics of the two case universities in this study.

SWOT for integrating e-learning at the two case universities

For most issues, we found common strengths, opportunities, weaknesses or threats for developing e-learning in the two East African countries. Both institutions have a strength of management commitment to e-learning. The strong political will for e-learning was also found to be present in Tanzania and Uganda in the study of Kasse and Balunywa (2013). Regarding the weaknesses, the respondents of the two universities report that there is no specific policy support for implementing e-learning. Both institutions have limited resources, facilities, available computers, Internet access and stability. In addition, a main issue of concern is that there is a lack of staff capacity, competences and experiences in developing e-learning in both institutions. The positive results we found in the study are that most of the staff members in both institutions are highly interested in and willing to use e-learning. However, factors such as attitudes and motivations of some staff remain as challenges.

Similar to all underdeveloped countries, capacity-building projects with ICT support have been hampered by infrastructural challenges, such as lack of electricity, lack of necessary hardware to facilitate continuous access to e-learning, higher Internet costs and its unavailability (Eke, 2011). Grönlund and Islam (2010) also asserted that developing countries face obstacles in infrastructure, resources and information access for developing e-learning. In the two case universities in this study, the infrastructure, ICT equipment and Internet access have started to be significantly improved in recent years thanks to the support of the VLIR project and other donating organisations, and the situation will continue to improve thanks to the continuation of the project support in the next few years. On the one hand, this brings opportunities for the universities as the funding and capacity-building activities of these projects will strengthen the capacity of the universities (both infrastructure and staff competence) in developing e-learning. On the other hand, this can also be a weakness of the two case universities as their development of e-learning currently depends on external funding.

With regard to opportunities of e-learning, the staff members of MzU have elaborated on the benefits of e-learning or the opportunities that e-learning can bring for MzU, such as the wider participation for students, efficiency of course delivery and faster communication to a wider group of students in a short time. The need for more innovative assignments (such as group discussions and group projects) has been mentioned by the staff members. The staff members of MMU have elaborated on the current or future opportunities that are favourable for MMU to implement e-learning, such as training for staff to develop competences for e-learning, improvement of the Internet and facilities, external support and student population. Training in technical competence as well as pedagogical course design competences are both important for developing e-learning. The need for developing teachers' technological, pedagogical and content knowledge has been elaborated in the studies using the TPACK model (Mishra & Koehler, 2006; Tondeur, Pareja Roblin, van Braak, Fisser, & Voogt, 2013; Voogt, Fisser, Pareja Roblin, Tondeur, & van Braak, 2012).

With regard to weaknesses, staff from both institutions report that there is a lack of policy for e-learning. Limited funding, limited facilities and limited capacity of staff to develop e-learning are key issues too. The competence of teachers is especially a critical issue. Although some teaching staff may have the basic ICT skills, they still lack the competences and experience of integrating e-learning into their course delivery. In general, the competences of faculty members in how to apply

e-learning are limited. This was also found in other research in the African context (e.g. Kahiigi et al., 2008). For example, the study of Kasse and Balunywa (2013) found that human resource capacity is identified as a key constraining factor for implementing e-learning in Uganda. The lack of facilities (available hardware and software) is a critical challenge for both institutions. This also gives support to the study of Kasse and Balunywa (2013) that the lack of facilities is an important constraining factor for e-learning in Tanzania and Uganda.

Another common weak point is the resistance to change or negative attitudes of some staff towards e-learning and the negative attitudes of some students towards learning. Previous studies point out that e-learning adoption has been highly affected by attitudinal challenges from both teachers and students (Annika & Åke, 2009). According to Abdel-Wahab (2008), attitudinal factors like perceived ease of use of e-learning, perceived usefulness of e-learning and availability of resources affect the intention to adopt e-learning by both students and teachers in higher education. The adoption of e-learning of students is also determined by whether they are satisfied with the quality of service offered by e-learning (Eke, 2011). In order to provide quality e-learning services, training for staff in the following areas is crucial: course content, course design and course delivery, technological competences and, if possible, learning activities that can affect their educational beliefs and attitudes (Annika & Åke, 2009).

With regard to the threats, the respondents from both settings highlight the following main issues: funding and resources, passive learning culture, lack of relevant policy, low competence and lack of support. The acquisition of adequate technological infrastructure and adequate human resources is very important for developing e-learning. This has been confirmed by both groups of respondents in Tanzania and Uganda. These requirements can only be met by an increased budget within these institutions (Psycharis, 2005). In addition, the resistance or negative attitudes of some staff are mentioned by the respondents as a threat. The passive learning culture seems to be a big problem in the two African universities. The results indicate that culture is an important aspect when considering educational innovations (Zhu, 2013, 2015). Another unique or typical challenge in the African setting is the workload of both teachers and students, as most of them are having several roles or doing several things in their lives and thus have less time or energy to engage in new ways of teaching and learning.

Capacity building for integrating e-learning

The SWOT analyses provide us with the perceived strengths, weaknesses, opportunities and threats to integrating and implementing e-learning in two universities in Tanzania and Uganda. The results also point out directions for capacity building from three main aspects: institution-related, instruction-related and investment-related aspects.

In terms of institution-related aspects, the vision of the university and relevant policies are important. In order to formulate suitable and sound policies for the university, the university leadership needs to get a comprehensive picture of the advantages, strengths, opportunities, as well as the weaknesses and threats that they face in developing and implementing e-learning. With regard to university policies, on the one hand, the university needs to have a good view of its needs and select appropriate, cost-effective and sustainable hardware and software (Guttman, 2003;

Haddad, 2007); on the other hand, the university needs to provide support for teacher capacity building and competence development. Therefore, developing enabling infrastructure and equipping staff with the relevant competences is a definite need for interventions at the institutional level. Institutional capacity building also aims at developing adequate awareness of key ICT developments and opportunities within the local context.

In terms of instruction-related aspects, the competences of teachers and staff are crucial. There is an urgent need to develop teachers' competences in designing and implementing e-learning (Hughes, Ventura, & Dando, 2004). The professional development of teachers should not only involve the technical aspects but, more importantly, the pedagogical, social and cultural aspects (Otero et al., 2005). Teachers need to innovate and optimise their educational practices by engaging with new educational concepts, technologies, teaching and assessment methods etc. With regard to the social and cultural conditions related to the implementation of e-learning, the teaching and learning habits of teachers and students are considered an important aspect.

In terms of investment-related aspects, on the one hand, the external funds offer opportunities for the universities to develop e-learning and enhance the capacity of the universities; on the other hand, this also causes challenges for the universities in sustaining the development by having their own resources, strategies and policies in place. The capacity-building activities of the relevant projects will provide a sound basis in terms of teacher competence development, infrastructure capacity building and engagement of university leaders. Previous studies point out that many ICT for education projects have mainly contributed the funds to hardware and very little to teacher or staff capacity building (Arinto, 2006). In the projects that this article is reporting on, ample attention has fortunately been paid to capacity building to enhance staff competences in developing and applying e-learning.

In summary, the SWOT analysis and capacity building from the three aspects offer a useful model to analyse the current situation and need for capacity building for e-learning. This model can be summarised as the 3I (institutional-, instructional- and investment-related) model. Future research can look into these three aspects and provide directions for capacity building relevant for the three aspects.

Limitations, implications and conclusions

This research is a small-scale study as it only involved a total of 40 academic staff from two universities in Tanzania and Uganda. The research method is mainly qualitative as it inquired about participants' views from focus group discussions. The survey data are mainly used for descriptive analysis regarding the current status, perceived readiness and experiences of e-learning of the participants. This study did not investigate the views of other stakeholders, such as university leaders, administrative staff and students. The participation in the focus groups was mainly voluntary, which might have an influence on the representativeness of the sample participants. For example, it might be that the staff members who were more interested in learning about e-learning came to the focus groups, while those who were not interested did not. Therefore, the findings from this study may not fully represent the opinions of all staff of the two institutions.

Despite the limitations, the findings of the study are helpful in providing insights for teachers, decision makers and other relevant stakeholders of the universities to

identify the needs, challenges as well as opportunities for developing innovative teaching and learning modes for ‘delivering’ education in rural settings in Africa. The insights gained from this study can be used as recommendations on what issues need to be addressed when the two institutions set out to adopt and implement e-learning. The results also provide us with a basis to look at the common issues and challenges faced by both institutions and also to situate the development phases of each institution based on its specific development stage and its specific advantage or disadvantage compared with its neighbouring country.

In summary, the research set out to investigate the current status, and perceived strengths, weaknesses, opportunities and threats to implementing e-learning at two case institutions. Common strengths and challenges were found in both institutions in which management commitment is high; however, there is still a gap in terms of available policy, infrastructure and staff capacity. Capacity building, especially in terms of staff competences, is very important (Hofmann, 2011). All three aspects (institution related, instruction related and investment related) of capacity building need to be considered for implementing e-learning and enhancing the effectiveness of e-learning. With the factors from the three aspects considered, as well as the internal commitment and efforts, the implementation of e-learning will benefit the educational delivery to reach more students, and provide more innovative ways of teaching and learning and enhance the quality of education in the two case universities of this study.

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