

A MODEL FOR SCAFFOLDING TRADITIONAL DISTANCE LEARNERS IN AFRICA FOR CONSTRUCTIVISTIC ONLINE LEARNING

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Abstract

How can we solve the lull in uptake and usage of online learning amongst traditional distance learners in Africa? Several online learning initiatives are taking place in Africa, but a critical assessment of their impact in terms of increasing access to higher education through distance learning indicates, in most cases, lack of value for money. A few distance learners use online learning management systems and other online resources in those institutions. How then do we interest and motivate the majority of traditional distance learners in Africa to adopt and uphold online learning practices? This paper provides a model that can be used to scaffold traditional distance learners in Africa for constructivistic online learning. The framework is built based on experiences derived from a survey of third year Bachelor of Commerce distance learning students at Makerere University who participated in an online learning pilot. The students were, for their very first time, asked to undertake three out of ten modules of an Information Technology course using an online learning mode. This course had previously been tutored using traditional face to face and print based materials methods. The three online modules were tutored using the Blackboard™ Learning Management System. The model is important for managing change from traditional distance learning delivery methods to online delivery methods and ensuring that distance learners in Africa uphold online learning practices.

Keyword

Constructivistic Online Learning, Learning Management System, e-Learning, Online Learning, Traditional Distance Learning, Makerere University

Introduction

The use of ICTs in education is increasing attention from educationists and policy makers in Africa. Africa's development partners are equally injecting resources into online learning related projects. At Makerere University, the Carnegie Corporation of New York and Nuffic supported the setting up of an e-learning infrastructure at its main campus. The Economic Commission for Africa, USAID, UNDP, Carnegie Foundation, World Bank, the Swiss Co-operation, DFID, AVU and UNESCO have supported the implementation of ICT in education at the National University of Rwanda (NUR) and

the Kigali Institute of Science and Technology (KIST) (Farrell, 2007). The University of Nairobi has partnered with Google to improve access to Web-based communications for staff and students so that they can get free access to Google applications (ibid). The African Virtual Open Initiatives and Resources (AVOIR) project was coined amongst eight higher institutions of learning from Kenya, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, and Uganda to develop KEWL Nextgen Learning Management System (LMS) and build capacity for e-learning in Africa (Farrell and Isaacs, 2007). The AVOIR project aimed at enabling African universities to build a cost effective and sustainable learning management system.

Despite all the efforts expended in developing e-learning in African universities by the universities themselves and their development partners, usage and uptake of e-learning is still lukewarm. While giving a report on the implementation and impact assessment of e-learning at Makerere University, Tusubira (2006, p.5) wrote:

Although the policy drivers are in place, we need to devise mechanisms that will enable implementation on the ground. For instance, while the priority faculties have e-learning infrastructure in place they do not yet have any requirements in place for staff to create online courses. We are going to work with the DVC - Academic affairs to explore avenues for faculties to define their expectations from staff as regards e-learning

This revelation indicates lack of an enforcement strategy for e-learning at Makerere University in particular and Uganda in general. This picture is not very different from that in many other African countries. For instance, the Rwandan Government promulgated its ICT policy in 2000 but eight years down the road, usage of public ICT infrastructure (Community Information Centers) remains paltry. A feasibility study on the usage of Community Information Centers in Rwanda indicated “that only 7% of the population have ever used the Internet, and 71% have never even heard of it – not surprising given that the vast majority of Rwandans live in rural areas” (Farrell, 2007, p.6).

Usage statistics aside, there is a myriad of proprietary and open source LMS being marketed in different African universities. Although, in the AVOIR project, KEWL Nextgen was ‘supposed’ to be developed as the LMS of choice in eight African universities, its uptake among the intended universities has been minimal. At Makerere University, users have abandoned KEWL Nextgen LMS in favor of the Blackboard™ LMS (BBLMS). At the University of Nairobi, Wedusoft ELE developed from Chisamba is being used. This shows that a number of universities in Africa are still shopping for appropriate LMS.

Low uptake and usage statistics for e-learning and instability in LMS in Africa call for research into the development of electronic or online learning scaffolding models. Such models are important for guiding the introduction and sustenance of e-learning. In this paper we propose a model for scaffolding traditional distance learners for constructivist online learning. We have chosen to scaffold distance learners for online learning because they present an ideal target group for e-learning in Africa. Also the line separating distance and online learning is fading. The scaffolding model is underpinned by the constructivist learning paradigm. Constructivist learning empowers the learner with the necessary tools, resources and freedoms for learning (Naismith et al., 2006). This empowerment enables learners to actively engage in the learning process, construct their own knowledge, collaborate with others, know their learning intentions, contextualize

their learning, freely converse with others and reflect on what they are learning. The model is built from results of an evaluation of traditional distance learners at Makerere University who utilised the BBLMS, for their very first time in life, to complete three out of ten modules of a course called 'Information Technology II' (IT II).

The paper is divided into six sections. Section 1.0 sets the stage for the paper. The paper's theoretical framework is given in Section 2.0 while the materials and methods used are presented in Section 3.0. Results and discussion are presented in Section 4.0 and the proposed scaffolding model in Section 5.0. Finally, the paper is concluded in Section 6.0.

Traditional Distance Learning

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Distance learning has been variously defined. It is the form of learning where the learner is distant from the educational institution providing the relevant tuition (Watson and Pervaiz, 2004). Distance learning, sometimes referred to as distance education, entails reaching out to learners wherever they are and providing them with the necessary tuition and information (Wang and Liu, 2003). The definitions expositioned here indicate that a distance learner is separated by time and space from his/her institution of learning. Electronic and/or other student support methods can be used to bridge the gap between the distance learner and his/her instructors.

In Africa, distance learning has traditionally been provided using print-based modules that are supplemented with specific numbers of residential sessions in a semester at the mother university. At Makerere University, there are two residential sessions each of two weeks, in one semester of 17 weeks. The two residential sessions are separated by a period of 11 weeks. In this paper we refer to this mode of pedagogy as 'traditional distance learning' and learners benefiting from such pedagogy as 'traditional distance learners'.

Traditional distance learners have seldomly used ICTs in their learning. In recent times however, there has been some effort to introduce ICTs in the traditional distance learner support systems (Muyinda *et al.*, 2008; Farrell and Isaacs, 2007; Aguti and Fraser, 2006). However, planned introduction of ICTs in the distance learner support system has so far attracted less research (Laurillard, 2007). We thus need models for guided introduction and sustenance of ICT support systems such as online learning amongst traditional distance learners.

Online Learning

Online learning is an element of e-learning. E-learning is the use of latest computer technologies such as distributed networks, mobile devices and other digital platforms to provide avenues for electronic delivery of learning content and other academic and administrative services (Watson and Pervaiz, 2004). Whereas e-learning encompasses all electronic media for delivery of learning, online learning mainly uses desktop computers with connectivity to a learning management system. The connectivity is usually via the Internet or Intranet.

Online learning is permeating in the learning and teaching spaces of African universities with South Africa taking the lead position (van Brakel and Chisenga, 2003). At Makerere University, online learning is made possible using the Blackboard, KEWL Nextgen,

and TUSK learning management systems. At the University of Nairobi, online learning is provided through Wedusoft ELE. At the University of Cape Town, online learning is made possible through Sakai while at the University of Pretoria, WebCT is the online learning management system. In other words, there are a mixture of open source and proprietary learning management systems in use in African universities. In all these universities, online learning just supplements the traditional face-to-face learning and teaching methods. Online learning can remove the barriers of time and location usually associated with the traditional face-to-face delivery models (Hay *et al.*, 2004). This attribute is very vital for enabling distance learning. Use of online learning in Africa, however, is still at its infancy.

Despite the hypnotization of online learning in Africa, there is a dearth in models for its successful introduction and sustenance to traditional distance learners. Since online learning is becoming part and parcel of the delivery systems, there is need to carry out research into the development of online learning scaffolding models.

Theoretical Framework

There has been an agitation for a learning paradigm shift from content-based and instructor-led learning models to student-centered constructivist learning models (Fisher and Baird, 2006-2007; Woukeu *et al.*, 2005). The agitation comes from the realization that teachers and text books are no longer the sole fountain of knowledge in the era of the World Wide Web. What the students need currently is empowerment to be able choose from the multitude of information surrounding them. The constructivist learning paradigm becomes the learning paradigm of choice since it promotes independent learning.

The constructivist learning paradigm

The constructivist learning paradigm was first espoused by Bruner in 1966 and later on refined by Vygotsky in 1978 (Naismith *et al.*, 2006, p.12). The paradigm states that “learning [is] an active process in which learners construct new ideas or concepts based on both their current and past knowledge” (Bruner (1966) as cited in Naismith *et al.*, 2006, p.12). For one to construct their own knowledge, they must be actively engaged in the learning process, collaborate/converse with others, know their learning goals, contextualize their learning, and reflect on what they are learning (Fisher and Baird, 2006-2007). Active engagement of students in technology mediated learning, demands that the technology be designed in such a way as to serve the needs of the learners and not the learner serving the needs of technology (Naismith *et al.*, 2006). The technology should be designed with the learner in mind. In Africa, students find themselves using ready made technology with no or little adaptation to African contextual spaces. As perpetual technology users (not creators), models for adapting to new learning technologies are vital. Adaptation is good when it is based on a thorough understanding of the learners’ profiles.

Active learning

The philosophy behind active learning postulates that learning is not just about listening to the lecturer in the classroom but is about listening, writing, discussing and being involved in solving problems (Bonwell and Eison, 1991). Active learning is syn-

onymous with participatory hands-on learning. To enable active learning, an instructor has to include instructional activities which engage the learner in the learning process. Such engaging instructional activities relate to providing: classroom discussions, in-text activities, brief demonstrations, hints to short un-graded writing exercises, provoking/rhetoric questions and feedback to learners' questions and issues (Bonwell and Eison, 1991). These instructional activities promote students' higher order cognitive skills. Research has also shown that volatility in learning styles of learners require the adoption of various pedagogical methods for delivering learning other than the lecture method (Bonwell and Eison, 1991). Active learning integrates a host of learning methods that fit into the realms of the different learning styles. Instructors following a constructivist learning paradigm, where the learner is the sage-on-stage, and the instructor, the sage-on-the-side, should be prepared to experiment with alternative learning approaches that are likely to increase active learning. Active learning favorably influences student's attitudes and learning achievements (Bonwell and Eison, 1991). In Bonwell and Eison's own words:

Visual-based instruction, for example, can provide a helpful focal point for other interactive techniques. In-class writing across the disciplines is another productive way to involve students in doing things and thinking about the things they are doing. Two popular instructional strategies based on problem-solving model include the case study method of instruction and guided design. Other active learning pedagogies worthy of instructors' use include cooperative learning, debates, drama, role playing and simulation, and peer teaching (p.3).

In other words, active learning is learning by doing and thinking about what one is doing.

Collaborative learning

ICTs foster collaboration/discussions and interaction among learners. Pedagogically, collaboration and interaction present a vast amount of benefits to the learner (Uden, 2007). Collaboration and interaction enable learners to share information in form of data, files and messages. If the objectives of a course are to promote long-term retention of information, to motivate students toward further learning, to allow students to apply information in new settings, or to develop students' thinking skills, then discussion is preferable to lecture (McKeachie *et al.* 1986). Collaborations or discussions enlist various view points derived from various sources and authorities. An instructor must however moderate the discussions in order to guide learners on the 'wheat and chuff'. Collaborative learning draws its epistemology from collaborative learning theory espoused by Vygotsky in 1978. It is closely related to the Pask's (1975) conversational learning theory which requires that continuous two-way conversation and interaction be established between the teacher and learner and amongst the learners themselves if learning is to take place. Online learning can be underpinned by the collaborative learning theory because it can facilitate and enhance learner collaboration through e-mails, discussion boards and online charts. Computer based collaborative learning could as well draw from the situated learning theory (Lave and Wenger, 1991) which stresses the positive role of social interaction in the learning process. Learning is only possible if the two parties participating in the collaboration can understand each other.

Conversational learning

The conversational learning theory (Pask, 1975) requires that continuous two-way conversation and interaction be established between the teacher and learner and amongst the learners themselves if learning is to take place. Learning is about sharing information and information can be shared through a conversation (Brown, 2005). The two parties participating in the conversation must be able to understand each other. This happens if “Person A [makes] sense of B’s explanations of what B knows, and person B can make sense of A’s explanation of what A knows” (Naismith et al., 2006, p.15). This means that learning results from continuous conversations with peers and the teacher or a device which subsumes the role of teacher. In all the conversations, however, successful learning will take place when the learner is in control of the learning environment/activity (Naismith et al., 2006). For a learner to control her/his environment, s/he ought to have at her/his figure tips, the necessary concepts for the conversion. This requirement motivates learners to carry out independent research prior to holding a conversation or discussion hence encouraging constructivist learning.

Intentional learning

Intentional learning refers to cognitive processes that recognize learning as a goal rather than an incidental outcome (Bereiter and Scardamalia, 1989). This implies that each learning unit or module or course should have a stipulation of the learning objective(s) or learning goal(s). Learning units with learning goals motivate learners to continue learning until they achieve the target learning outcome(s). Thus intentional learning is not just about getting good grades alone but is also about fulfilling the learning goal(s) of the learner. Studies of achievement motivation have shown that “children with learning goals select more challenging tasks and persist longer whereas children with performance goals tend to select undemanding tasks and withdraw when difficulties are encountered” (Lamon, *et al.*, 1993, p.2). Once learning goals are clearly spelt out and meet the learner’s intentions, learning becomes a valued part of the learner’s life (Bereiter and Scardamalia, 1989). Intentional learning abets constructivist learning as Huber and Hutchings (nd) put it.

Intentional learners have a sense of purpose that serves as a kind of ‘through line’... connecting the sometimes far-flung and fragmentary learning experiences they encounter. They approach learning with high levels of self-awareness, understanding their own processes and goals as learners, and making choices that promote connections and depth of understanding. They know how to regulate and focus their efforts as learners—how to make the most of their study time, to practice new skills, to ask probing questions. They are, if you will, on the road to life-long learning. (p. 7-8)

The implication here is that intentional learners are self-motivated and can construct their own knowledge aimed at meeting a given learning outcome.

Contextual learning

Learners, especially those studying by distance mode are usually located in different learning contexts. It is important to provide learning which adapts to the learner’s context (Low and O’Connell, 2006). Context is information which describes the situation of a learner in a given location (Uden, 2007). It “is typically the location, identities of

nearby people, objects and changes to objects” (Zhang, 2003. p.7). Context therefore represents ones surrounding and the facilities and resources therein. Context is thus not static because it changes as the learner moves from one location or knowledge level to another. Learning is contextualized when it is embedded in the learner’s contextual space (Low and O’Connell, 2006). One way of contextualizing learning is by giving learners examples that are relevant to their context. For instance, in a typical rural village primary school in Africa, it would be none pedagogical to give tap water instead of spring well as an example of a water source for human beings. As another example, providing tuition via online learning methods alone to students with no computers and electricity is none contextualized learning pedagogy. When learning is not contextualized, learners are de-motivated and are not encouraged to construct their own knowledge as would be required by the constructivist learning approach.

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Reflective Learning

“A critical element of reflection is the ability to stand back and understand what is happening and why” (Hay et al., 2004, p.170). To embed reflective learning in learning content, instructional designers should develop a mentor image in the content. When the learner reads new content s/he critically thinks and evaluates the experiences it presents (Hay et al., 2004). Since anytime anyplace learning is possible in online learning, learners can get space in their free time to sit back and deeply reflect on the learning content. “Deep learning is a prerequisite to reflective learning” (Hay et al., 2004, p.172). In order to gauge whether the learner has critically thought about and evaluated the learning content presented to them, a reflective question such as, ‘give any other example of an input device you know of’ could be paused after the content, ‘all devices used to input data into the computer are called input devices and an example of such device is the keyboard’. To complete the reflective learning process, when the learner gives his/her answer to the reflective question, a feedback should be provided. Feedback could be instantly provided, as is the case in online learning or could be solicited through a discussion or interaction with instructors and/or fellow students. Reflective learning enhances learner’s higher level thinking and decision making skills and changes ones way of knowing as new experiences are encountered (Hay et al., 2004). Reflective learning therefore abets constructivist learning.

Materials and Methods

The model proposed in this study is underpinned by the constructivistic learning framework, which in turn is informed by feedback received from traditional distance learners who participated in an online learning programme for their very first time in life. Third year Bachelor of Commerce distance learning students at Makerere University were required to learn three out of ten modules of the IT II course using the BBLMS. The remaining seven modules were delivered using the traditional paper-based and face-to-face methods.

During their first residential session, traditional distance learners (hereafter referred to as learners) were informed of the delivery methods that were to be employed in the course. Learners were given a classroom tutorial on how to start the BBLMS, create a user account, login and enrol oneself on the IT II course. The classroom tutorial was supplemented with a one page step-by-step guide on using the BBLMS. Further, learn-

ers were given a course outline stipulating the method of delivery for each of the ten modules. As the course progressed, the lecturer provided facilitation support and paced the learners.

When the learners returned to the University for their second and final residential session, we carried out a process evaluation to get learners' experiences with online learning and suggestions for long-term sustenance. The evaluation was done using a survey questionnaire which had closed and open-ended questions which means that qualitative and quantitative approaches for data collection, analysis and reporting were used. The survey questionnaire was sectioned according to the components that make up the constructivistic learning paradigm, namely: active, collaborative, constructive, intentional, contextual, conversational and reflective learning. All the learners who reported for the second residential session (456) were issued with the survey questionnaire. Three hundred and twenty (320) responses were returned representing a response rate of 62% which by any standard is appropriate in surveys.

Learners were also interviewed through e-mail prompts sent to them by the tutors. The results of the study are presented in the section that follows.

Results and Discussion

This section presents the learners' online learning context which is thereafter evaluated based on the constructivistic learning framework. Finally, it presents the proposed model for scaffolding learners for constructivistic online learning.

Learner's online learning context

We present the context of the online learners in terms of their general ICT skills levels, online learning costs, challenges and advantages and suggestions for sustainable online learning.

Learners' ICT skills level

In order to determine whether learners experienced any challenge as a result of lack of basic computer use knowledge, learners were asked to state their level of ICT skills at the time of introduction of online learning. Results indicate that 11% had excellent knowledge, 19% had very good knowledge, 48% had fairly good knowledge, 16% had basic knowledge, and 6% had no knowledge. For one to work well with the BBLMS, s/he ought to have at least fairly good computer use skills. Even if this is the case, students' 'ICT skills level' did not have any influence on 'how one accessed online content and activities' as is seen in *Table 1* below.

Table 1: Influence of ICT skills on learner's access to online learning resources

	How I accessed online content and activities			Total
	By myself	Photocopied	Borrowed	

IT skills at time of access	Excellent	35			35
	Very good	60			60
	Fairly good	125	30		155
	Basic	25	20	5	50
	No Knowledge	10	5	5	20
Total		255	55	10	320

At a level of significance of $p \leq 0.05$ and 28 degrees of freedom a chi-square test on 'IT skills at time of access' and 'how one accessed online content and activities' yielded $p=0.534$. This implies that ICT skills level had no influence on learner's accessibility to online learning resources. This may be because all learners were first given training on the basics of using the BBLMS.

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Cost of online learning to the learners

We determined the online learning cost context so as to establish whether learners could afford taking online courses or not. Results indicate that the online learning process was very costly to the majority ($n=295$) of learners. The cost centres for online learning were: access to online resources ($n=160$), time used for looking for and booking Internet connected computers at the main campus ($n=90$), printing content downloaded from the BBLMS ($n=30$) and transport to Internet cafes located in towns for learners based in remote rural areas ($n=15$). Only 20 of the respondents found the cost of online learning being relatively cheaper than the cost of photocopying handouts in absence of online learning. Some learners did not incur any online learning costs because they accessed the BBLMS free of charge from the main campus ($n=80$) or their offices ($n=35$). On average, a learner paid between UGX 25 (\$0.015) and UGX 200 (\$0.118) per minute to access the BBLMS from an Internet café. Hence a learner who used an Internet Café to access BBLMS for utmost one hour every day spent between \$27 and \$212 per month. This is a costly venture for a student in Africa. Charges for Internet access in Kampala city were relatively lower than those in up-country towns.

Challenges faced during online learning

Costs aside, there were a number of other challenges faced by the learner during the online learning episode. Limited access to online learning facilities and resources ($n=295$) and limited ICT skills ($n=195$) were the number one and two challenges experienced respectively. Others were: cost of online learning ($n=35$), lucid and unclear instructions ($n=35$) and exposure to computer viruses ($n=25$). Very few learners ($n=25$) went through online learning with no challenge. Most of these challenges require institutional rather than learner originated solutions to solve. Learners attributed limited access to BBLMS to: low bandwidth, high student to computer ratio (over 100 learners to 1 computer), intermittent Internet connection and time restriction for using Internet kiosks at the main campus (one hour maximum per visit). Other factors that led to limited access were: lack of adobe acrobat reader on some computers that were being used to access PDF formatted online resources, lack of SMS messaging system in the BBLMS and simply having nowhere to access from for learners that were based far deep in the rural areas. "Lack of access can adversely influence learners' experience in the environment"

(Caudill, 2007, p.4).

Advantages accruing from online learning

Even with the above challenges, online learning presented numerous advantages to the learners. Some interesting advantages are reproduced below:

- It obliged me to always check on my e-mail
- It is cheaper than the usual practice of photocopying handout
- Materials are accessed quickly which allows us to prepare for exams
- We were able to exchange information with our IT facilitators
- I was able to use Internet not only for academic reasons but also for other purposes such as news, sports and showbiz (entertainment)
- Well, it was so convenient in that I always got the notes with ease moreover well explained notes as compared to those of past years
- It helped me revise while at work because the work was saved on my computer
- It is convenient because once the BBLMS is operating one can be able to receive any messages from Makerere University
- It is convenient both for local and international student who can access it anywhere anytime both for working and non-working class of people
- It was enjoyable and prestigious
- It is the cheapest learning materials for me because getting the work printed is cheap and easy
- It is good learning system for the working class students with Internet services at office
- I freely downloaded content without hassling with handout sellers at main campus
- Very convenient, other than just waiting for face to face, after work you just download your notes
- I saved a lot of money as I used to read notes online
- It was convenient for me because it became easy for me to get modules to read when I was upcountry which was not easy before
- It is convenient because I could easily access the notes from upcountry and I could not bother to send for notes from Kampala students especially for IT II.
- I have been getting frequent updates on what is happening outside lecture hall's walls
- IT II online learning improved on my computer literacy
- The notes are also readily available in their original form anytime one needs them
- If we had e-resources, it would be the best method to equip ourselves on our IT basics

Source: Primary data

The advantages given above confirm that online learning increases access to learning resources at anytime in any location and can be cost effective if well planned. However, online learning advantages can only be achieved when easy and cheap access to online learning facilities is made available within the vicinity of the learners.

Suggestion for sustainable online learning

For online learning to flourish, learners' attitude towards it must be positive. Learners' attitude towards a course can be influenced by the way a lecturer presents the subject matter in the course and the convenience with which the learners access the subject matter. We therefore asked the learners to provide a list of things that their lecturers and University should put in place for sustainable online learning. According to the learners, lecturers should first train/sensitize learners in practical IT skills and techniques for using the BBLMS (n=160). Training was followed by the need to provide hassle free access to online facilities and resources (n=125). The phrase 'hassle-free access' is used in this study to mean availability, within the learner's vicinity and reach, of high speed Internet and all necessary online learning facilities and resources. When learners are ICT literate and have hassle-free access, then there would be meaningful learning if student - student and student - teacher collaboration was enforced (n=90) and continuous support to online learners provided (n=80). According to the learners, continuous support would involve providing all the information necessary for the successful completion of a given course. Other factors that would propel learners into using online learning relate to the provision of a questions and answers section in the BBLMS (n=45), tailoring the content to the learners' needs and learning styles (n=15) and motivating learners (n=15). Motivation could be by way of rewarding learners with some few marks for participating in online learning. Indeed, enrolment to the IT II course jumped from 206 to 498 when the facilitator sent learners system generated statistics about their participation in the BBLMS with a comment that such statistics would contribute some marks to their coursework grade.

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Similarly learners made macro suggestion that Makerere University could adopt to sustain online learning. Improving the student -computer ratio was seen by most learners (n=250) as being the number one issue Makerere should address. At present the computer to student ratio at Makerere is over 100 learners to one computer. The recommended ratio is 5 learners to 1 computer (Tusubira, 2006). Even when the ratio is brought to the recommended level, there would be no space to accommodate the computers. Learners felt that access to computers would be greatly improved if more computer laboratories were constructed at the main campus and in satellite centres, computer laboratories were operated in a 24/7 fashion, learners and staff were provided with laptops on hire purchase order, the University reduced on student intake, old computers were disposed of and less costly systems such as those based on thin client architecture were procured. Second to ensuring an appropriate student-computer ratio was the need to ensure a resource rich, user-friendly and informative online learning environment (n=100). Learners were of the view that the online learning environment should provide all needed content, some room for fun, career information, mobile telephony messaging, timely updates and feedback, FAQs, learners' results and chat and collaborative possibilities. The need for a stable, easily accessible and high speed Internet (n=85) took the third place on the learners' suggestion list. Learners suggested that Internet should be installed on all computers in the computer laboratories at the main campus and satellite centres. Learners also suggested the installation of wireless Internet access points at convenient locations at the main campus and student hostels. Other suggestions made were: sensitising staff and learners (n=40) on online learning, ensuring regular maintenance of computer systems (n=35), democratising use of computers by university learners in all faculties (n=20), introducing a compulsory basic IT literacy course (n=10), having affirmative access to

online facilities in campus for distance learners during their residential sessions (n=5) and blending classroom with online learning methods (n=5).

A constructivistic evaluation of the online learning context at Makerere University

In this evaluation we establish whether IT II online learning fulfilled the active, collaborative/conversational, constructivist, intentional, contextual and reflective learning paradigms.

IT II online course and active learning

We sought to adduce whether active learning took place or not by determining the extent of hands-on participation of the learner during the IT II course. It was established that 83% of the learners created their own user accounts on the blackboard while 17% sought assistance from their friends to create the accounts.

When asked to indicate their keenness in looking for updates on the BBLMS, the majority (44%) said they checked for updates 2 – 3 times a week. A big proportion of learners (19%) rarely checked for updates while an almost equal proportion (18%) checked once every day. Eleven percent (11%) checked for updates once a month and 6% checked 4 – 6 times a week. Very few learners (2%) frequently checked for updates (checked more than seven times a week). If learning was to be active all learners ought to have frequently checked for updates. This was not the case hence no active online learning took place at this level.

At the level of engagement between the lecturer and learners, *Table 2* indicates that 84% believed the lecturer provided regular updates though an equally big proportion (76%) never consulted the lecturer when they were stuck. Of those who did not consult their lecturer, 65% chose to consult their classmates. Sixty one percent (61%) of those who consulted the lecturer said he responded to their queries.

Table 2. Engagement of the lecturer and learners in the online learning process

Kind of engagement	SA	A	D	SD	Total
Lecturer provided regular updates	45	39	10	6	100
When stuck, I asked classmates to direct me	19	37	19	25	100
Classmate's advise was useful	18	47	20	15	100
When stuck I asked my lecturer to direct me	11	13	33	43	100
Lecturer responded to my queries	39	22	25	14	100

Key: SA (Strongly Agree), A (Agree), D (Disagree), SD (Strongly Disagree)

The statistics in Table 2 show that both the learners and their lecturer were actively engaged in the learning process. Regular updates and feedback to learners' queries abets active learning.

IT II online course and collaborative/conversational learning

There was good learner - learner and learner – lecturer collaboration. The collaboration was via either electronic or non-electronic media. Electronic collaboration employed

e-mail, cell phones, and the discussion board. Non-electronic collaboration was mainly done during residential sessions. Fifty two percent (52%) of the learners confessed having received updates on the IT II course from their course leaders during residential sessions. This is not to say that those learners did not collaborate by electronic means as well. The majority of learners (88%) had an e-mail address prior to the commencement of the IT II online course. Sixty four percent (64%) sent at least one e-mail to their classmates, while 62% sent to their lecturer. Only 53% confessed having received a reply from their classmates. The mobile phone was used for learner-to-learner collaboration by 38% of the learners while the discussion board was used by 42% of the learners to discuss topical issues posted in the BBLMS by the lecturer or learners themselves.

IT II online course and constructivist learning

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As Naismith *et al.* (2006) observed;

Within a constructivist learning framework, instructors should encourage students to discover principles for themselves. In order to transform learners from passive recipients of information to active constructors of knowledge we must give them an environment in which to participate in the learning process, and the appropriate tools to work with that knowledge (p.12)

We gauged the ability of learners to construct their own knowledge from their past and current experiences and knowledge. The results are shown in *Table 3* below.

Table 3. IT II online course and constructivist learning

Constructivist learning aspects	SA	A	D	SD	Total
Instructions given to me for using BBLMS were sufficient	52	29	16	3	100
I, on my own, discovered new features on BBLMS	20	38	28	14	100
The use of BBLMS improved my ICT skills level	41	43	13	3	100

It is evident from *Table 3* that there was constructivist learning. Learners (81%) concurred that face-to-face tutorial and the one page step-by-step guideline on how to use the BBLMS were sufficient enough to let them participate in online learning. Consequently 58% were able to construct their own knowledge by discovering new features of the BBLMS that were neither taught in the face-to-face tutorial nor specified in the one page guideline. Indeed, from the knowledge constructed, 84% of the learners were able to improve their ICT skills level.

IT II online course and intentional learning

Clearly building the outcome of reading some content or doing a given activity in self directed learning is very vital. We asked learners to evaluate whether the learning outcomes were very clear in the content and activities posted in the BBLMS. *Table 4* summarises the results.

Table 4. IT II online course and intentional learning

Intentional learning aspect	SA	A	D	SD	Total
All content and activities had clear objectives/goals	43	50	7	0	100
I easily followed the online content even with no face to face explanation	18	33	33	16	100
I easily followed the online activities even with no face to face explanation	33	29	23	15	100

Table 4 indicates that the content and activities for IT II were underpinned by the intentional learning paradigm as 93% of the learners concur that the content and activities had clear objectives and goals. Despite this revelation almost half the learners (49%) could not easily follow the content and activities on their own. The relative newness of the learning method coupled with the numerous challenges to online learning explains this situation. Learners easily followed the online learning activities which included announcements, assignments, course information and other because these were simply meant to communicate to them. With time when online learning becomes part and parcel of the learner’s way of learning and when challenges to online learning are ironed out, intentional learning will be grounded in online learning.

IT II online course and contextual learning

Putting learning in learner’s context enhances their learning experience (Uden, 2007). The learner’s location is one contextual aspect considered to have significant influence on his/her learning. We therefore asked learners to indicate where they accessed the BBLMS from. *Table 5* presents the results.

Table 5. IT II online course and contextual learning

I accessed BBLMS	Yes	No	Total
From my home	3	97	100
From main campus	57	43	100
From my workplace	13	87	100
From Internet Café	52	48	100

Being distance learners, one would expect them to mainly access the BBLMS from their homes and workplaces. This was not the case as only 3% of the learners accessed from their homes and only 13% from their workplaces. Most learners accessed either from main campus (57%) or Internet café (52%). This implies that learning was not contextualised.

IT II online course and reflective learning

Reflective learning is achieved when a learner build a mentor image in the content. This is made possible when the learner has all the learning content and activities at his/her disposal. We therefore asked learners to tell us whether they could by ‘click of a button’ get to the online content and activities whenever they felt like. Twenty three percent (23%) strongly agreed to our question while 37 percent agreed. On the other hand 30 %

disagreed and 10 percent strongly disagreed. Hence reflective learning was not possible for 40% of the learners who could not easily access online content and activities by a simple 'click of a button'.

Towards the Online Learning Scaffolding Model

From the online context evaluation above and learners' suggestion on how to achieve active, collaborative/conversational, constructivist, intentional, contextual and reflective learning in online learning environments, thirteen (13) model components were identified. These include but in no specific order: 1) providing regular updates/feedback, 2) providing a hassle free access to online facilities and resources 3) providing a rich online learning environment, 4) imparting practical IT skills and techniques for using the BBLMS, 5) putting in place mechanisms for collaboration/discussion/interaction, 6) putting in place online learning incentives/motivators, 7) ensuring that learners are examined on the content in BBLMS, 8) blending classroom with online teaching and learning, 9) posting test, coursework and examination results on the BBLMS, 10) sensitizing staff and learners about online learning 11) using local examples to demystify the course, 12) regularly evaluating the online learning process, and 13) adopting online course structuring principles. The importance of each of these thirteen components as rated by the learners for each learning paradigm is depicted in *Table 6*.

Table 6: Ranking of online learning scaffolding model components

Scaffolding Model Components	Learning Paradigm (Count)					
	Active	Collaborative	Constructivist	Intentional	Contextual	Reflective
Providing regular updates/feedback	75	75	35	55	5	40
Providing a hassle free access to online facilities and resources	80	20	25	5	305	20
Providing a rich online learning environment	150	15	70	10	10	70
Imparting practical IT skills and techniques for using the BBLMS	55	20	80	10	5	25
Putting in place mechanisms for collaboration/discussion/interaction	30	120	25	25	0	10
Putting in place online learning incentives/motivators	40	0	30	5	0	15
Ensuring that online content is examinable	15	10	5	30	0	15
Blending classroom with online teaching and learning	10	20	5	35	5	30

Posting test, coursework and examination results on the BBLMS	10	0	5	0	0	5
Sensitizing staff and learners about online learning	15	5	25	5	5	5
Using local examples to demystify the course	0	0	5	0	225	0
Regularly evaluating the online learning process	0	0	5	0	0	20
Adopting online course structuring principles	5	0	15	140	0	15

Model components

To understand the proposed model, it is important to describe its components. *Providing regular updates/feedback* is one of the components of the online learning scaffolding model. Learners suggested the use of SMS messaging as the number one source of information whenever there was an update in the BBLMS. This in effect suggests the need to incorporate m-learning in online learning as more learners in Africa have access to mobile phones than PCs. Updates could as well be sent to learners via their e-mails. In a blended learning environment, learners suggested the use of notice boards and course leaders as avenues for disseminating information about updates put in BBLMS.

In the model we use phrase *hassle free access* to mean availability, within the learner's vicinity and reach, of high speed Internet and all necessary online learning facilities and resources. Learners felt that *hassle free access* could be achieved if access to computing facilities were democratized and more computers with stable and fast Internet availed to learners at the main campus and in satellite centres. This can enable learners get quick access to the vast resources hosted in the BBLMS, interact with each other and their lecturers and actively be engaged in the learning process.

According to learners, a *rich online learning environment* should have all the necessary course content with multimedia dispensation, revision questions and answers, frequently asked questions, assignments, tests, courseworks, all course information, links to appropriate further reading materials and any other pedagogic activity that will provide a rich learning experience.

Prior to using online learning, learners prefer that *basic practical IT skills and techniques for using the BBLMS* be given to them. This will encourage learning by freeing the learner from learning how to use the technology and hence availing more time for concentrating only on learning the course at hand.

Putting in place mechanisms for collaboration/discussion/interaction can encourage active participation in online learning. The mechanism suggested by the learners include: randomly grouping enrolled learners and giving them group discussion topics facilitated by the lecturer, encouraging learners to add their own discussion topics, giving group course works, setting questions requiring responses from learners, availing e-mail address of all learners and lecturers to the learners and teaching learners how to collaborate/discuss online. Where the lecturer may be overwhelmed by the number of

questions requiring responses, learners suggested the use of fellow learners with deeper understanding of the subject being discussed to work as assistant facilitators.

Being a relatively new mode of delivery, learners thought that introduction of *incentives/motivators* can encourage them to actively engage in online learning. Providing rewards such as giving marks to those participating in online learning, putting in the BBLMS career information, latest sports and IT news, jokes and brain teasers would encourage learners to actively engage in online learning. Caudill (2007) has suggested three ways of motivating learners through learner-driven motivation, institutional motivation (provide infrastructure) and teacher-led motivation – coercion (include compulsory learning activities on the BBLMS). The latter form of motivation could be achieved by ensuring that learners are examined on the content hosted on the BBLMS.

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The newness of the learning method to traditional distance learners further dictates the need to *blend online with traditional classroom learning*. Learners noted that online learning was not suitable for some courses. “I can’t imagine learning advanced accounting using the BBLMS alone”, said one of the learners. Such practical and mathematical courses, learners said, “should be taught in class and content provided on the BBLMS”. In Traxler’s (2007, p.8) views, however, it is possible to make a strong case for m-learning in practical cases because it allows “students to exploit small amounts of time and space for learning, to work with other students on projects and discussions, and to maximise contact and support from tutors.”

Posting test, coursework and examination results on the BBLMS is another way of motivating learners to participate in online learning because they will be coerced to visit the site to check on their results. By so doing, the BBLMS will be a daily check on site for learners.

Prior to its introduction, online learning was unknown to all the distance learners. Indeed there was initial resistance to its introduction but with constant *sensitisation* from the IT II lecturer, online learning was later embraced. The following e-mail messages sent to the lecturer by learners portray this phenomenon.

I asked most of the students who were present during that BBLMS lecture and most of them did not understand anything. Can we fall back to our traditional method sir!

Sir, it would have been good to introduce this form of learning to first years, not us who are about to complete our programme.

Then these were some of the messages towards the end of the course

I am glad that at last we are experiencing the true value of modern education. E-learning is the thing of the day. I would like to thank our lecturer for the timely release of the program. Whereas it comes with its own challenges, it should be embraced wholeheartedly

Sir, hope everything is fine! Thank you for waking up Makerere and the entire IT II class with the online mode of delivery.

The above messages depict a phenomenon of change which we attribute to the continuous *sensitisation* the lecturer made during online learning modules. *Sensitisation* should not stop at the learners but should extend to all the University staff as well.

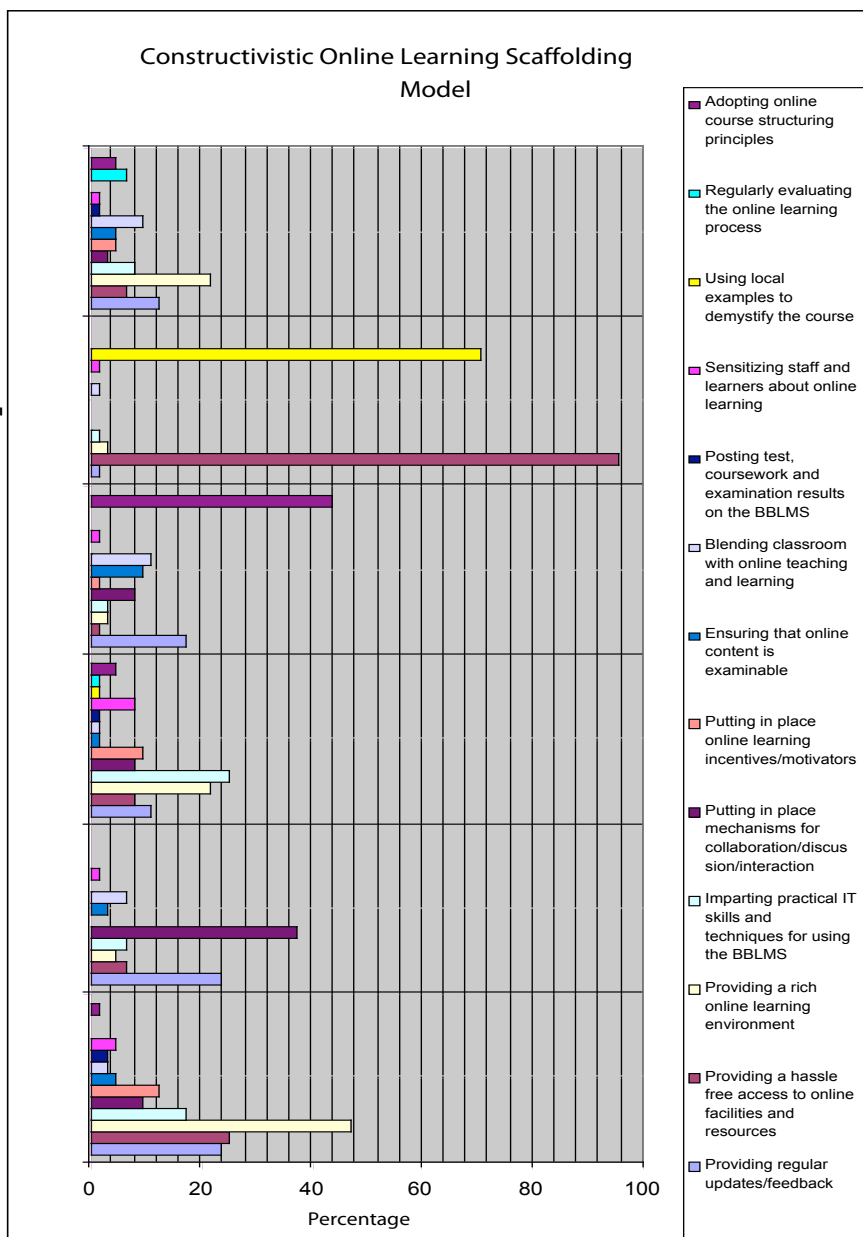
In order to contextualise learning, content should be structured with examples that have a local feel. *Using local examples* in self-study online learning materials increases the learner's understanding of the materials.

Regular evaluation of the online learning process is another component of a successful online learning model. Evaluation informs practice and therefore leads to better performance.

Adopting online course structuring principles implies the use of best practices for designing online courses. According to respondents, principles for online learning that should be adopted include: setting goals and objectives for each learning unit, module and course, using simple but rich subject language, starting from simple to hard concepts, providing a summary of the contents before getting into the depth of the content and choosing informative titles and sub-titles to content. Others include presenting one screenful of content at a time, defining terms and concepts at the beginning of each course unit, embedding activities in the content, providing revision questions with answers that can be provided on request and providing practical/application examples.

The components described above are combined in different proportions to achieve active, collaborative, constructivist, intentional, contextual and reflective learning as shown in Figure 1.

Figure 1. The proposed online learning model for traditional distance le



Scaffolding for active online learning

For active learning to take root, institutions should provide in order of importance: a rich learning environment (n=150), hassle free access to online facilities and resources (n=80), regular updates/feedback (n=75), practical IT skills and techniques of using the BBLMS (n=55), online learning incentives/motivators (n=40), examinable content (n=15), sensitisation programmes for staff and learners about online learning (n=15), blended learning (n=10) and results for tests and examinations on the BBLMS (n=10). They should also adhere to principles for structuring online courses (n=5). This com-

ponents combination compares well with Bonwell and Eison (1991) components for active learning which include providing classroom discussions, in-text activities, brief demonstrations, hints to short un-graded writing exercises, provoking/rhetoric questions and feedback to learners' questions and issues.

Scaffolding for collaborative online learning

In the model, collaborative learning in online learning can be propelled by putting in place mechanisms for collaboration/discussion/interaction (n=120), providing regular updates and feedback (n=75), providing hassle free access to online facilities and resources (n=20), imparting practical IT skills and techniques for using the BBLMS (n=20), blending classroom with online teaching and learning (n=20), having a rich online learning environment (n=15), examining learners on the online content (n=10) and sensitizing staff and learners about online learning (n=5). Pedagogically, collaboration and interaction present a vast amount of benefits to the learner (Uden, 2007).

Scaffolding for constructivist online learning

For learners to be able to reflect on their previous knowledge, compare it with the current knowledge and be able to construct their own knowledge while undertaking online learning, they must not be bogged down by the need to understand how to use the online learning technology. Active engagement of learners in technology mediated learning, demands that the technology be designed in such a way as to serve the needs of the learners and not the learner serving the needs of technology (Naismith *et al.*, 2006). In the model, having practical IT skills and techniques for using the BBLMS is vital if constructivist learning is to take place in online learning environments (n=80). Constructivist learning will also be possible when a learner is exposed to a rich learning online environment (n=70) which has regular updates (n=35), incentives/motivators for online learning (n=35), hassle free access to online facilities and resources (n=25), mechanism for collaboration (n=25), mechanisms for sensitising staff and learners on online learning (n=25) and well designed online courses (n=15). Other factors that abet constructivist learning are: ensuring learners are examined on the content in the BBLMS (n=5), blending classroom with online learning and teaching (n=5), posting test and examinations results in the BBLMS (n=5), using local examples in the content (n=5) and undertaking regular evaluation of the online learning process (n=5).

Scaffolding for intentional online learning

In online and distance learning setting the goal and objective to be achieved out of a given learning content or activity is vital. Once learning goals are clearly spelt out and meet the learner's intentions, learning becomes a valued part of the learner's life (Bereiter and Scardamalia, 1989). In the model, achieving intentional learning demands for the adoption of principles for structuring online courses (n=140), providing regular updates and feedback to learners (n=55), blending classroom with online learning (n=35), ensuring that content provided in the BBLMS is examinable (n=30), putting in place mechanisms for collaboration/discussion/interaction (n= 25), providing rich online learning environment (n=10), imparting practical IT skills and techniques for using the BBLMS (n=10), providing a hassle-free access to online facilities and resources (n=5), putting in place online learning incentives/motivators (n=5) and sensitizing staff and learners about online learning (n=5).

Scaffolding for contextual online learning

Context is information which describes the situation of a learner in a given location (Uden, 2007). It “is typically the location, identities of nearby people, objects and changes to objects” (Zhang, 2003. p.7). In the model, contextualised online learning can be abetted by providing learners with hassle-free access to online facilities and resources (n=305), using local examples in content (n=225), providing a rich online learning environment (n=10), providing regular updates/feedback (n=5), imparting practical IT skills and techniques for using the BBLMS (n=5), blending classroom with online teaching and learning (n=5) and sensitizing staff and learners about online learning (n=5).

Scaffolding for reflective online learning

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We reflect on learning activities in order to develop mentor models in them. In the model, reflective learning can be enforced by providing a rich online learning environment (n=70), providing regular updates/feedback to learners (n=40), blending classroom with online teaching and learning (n=30), having practical IT skills and techniques for using the BBLMS (n=25), providing hassle-free access to online facilities and resources (n=20) and regularly evaluating the online learning process (n=20). Others include: adopting online course structuring principles (n=15), putting in place online learning incentives/motivators (n=15), examining learners on content hosted in BBLMS (n=15), putting in place mechanisms for collaboration/discussion/interaction (n=10), posting test, coursework and examination results on the BBLMS (n=5) and sensitizing staff and learners about online learning (n=5).

Conclusion

It is possible to have online learning in Africa blended with traditional distance learning techniques. What needs to be done is to ensure that learners and staff are ICT literate, have access to appropriate online learning resources within their vicinity at no cost, have mechanisms for continuous interaction and are motivated to learn. Further, providing regular updates/feedback to learners is an incentive to online learning. Other incentives for online learning include: ensuring that learners are examined on the content hosted in the learning management system, blending classroom with online teaching and learning, posting test, coursework and examination results in the learning management system, sensitizing staff and learners about online learning, using local examples to demystify the course, regularly evaluating the online learning process, and adopting online course structuring principles.

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