

## **A framework for the integration of e-learning in higher education institutions in developing countries**

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### **ABSTRACT**

The aim of this research was to design a framework for integrating e-learning in Higher Education Institutions in developing countries. Data were collected from 266 university students and staff of five universities in Uganda using a questionnaire. Data were analyzed using descriptive statistics. The requirements for e-learning integration were identified as; use of projection equipment; use of e-learning methods to teach and face-to-face method to administer tests and exams; harmonization of course content for e-learning and face-to-face during design phase; incorporation of 3D pictures, audio and videos in classrooms among others. The developed framework was validated for applicability using case studies in all the participating universities. Validation results indicate that the proposed framework, if well implemented can help improve e-learning integration in Higher Education Institutions operating in developing countries. This is because the framework provides a step by step approach to be used during e-learning integration and also identifies the key stakeholders and their roles for successful e-learning integration.

**Keywords:** *e-learning integration, e-learning framework, e-learning, blended learning, developing countries*

### **INTRODUCTION**

Developing countries face a number of challenges in their efforts to provide basic needs such as education. For example, there is limited infrastructure (Kituyi & Kyeyune, 2012), limited space and number of facilitators (Aguti, 2002) among others. The recent developments in the Ugandan education system that saw many children of school going age accessing free education at all levels except tertiary and university level have led to surging numbers of students enrolling to study in higher education institutions (Kituyi & Kyeyune, 2012; Aguti, 2002). This has made it very difficult for Higher Education Institutions (HEIs) to sustainably teach and manage students on the available infrastructure. The alternative option has been distance education. In 2005 for example, Makerere University Business School (MUBS) opened upcountry teaching centers in Jinja, Mbarara and Arua, where students could learn under the coordination of the staff at the main campus in Kampala. This system was praised by the populists. It achieved the object of bringing education services nearer to upcountry students. However, this system turned out to be very costly. For example, MUBS has employed staff to manage the activities conducted at study centers in addition to paying rent and transport costs. This therefore would not be sustainable in the long run, considering the fact that upcountry students pay lower tuition fees.

The advent of e-learning presented a cheaper and more cost effective approach to teaching at HEIs. Subsequently, Ugandan universities have adopted the technology. MUBS for example explored the possibilities of using e-learning to improve learning at the study centers in 2006. However, this did not succeed in the initial stages. The rationality of adopting e-learning for MUBS study centers has largely relied on integration of traditional teaching methods on ground and appropriately using web-based learning management systems, without compromising the university's quality standards of teaching. As Tsubira and Mulira (2006) rightly argue, the introduction of e-learning needs strategies to respond to three major challenges of cost, quality,

and demographics. Therefore, one can assume MUBS has failed to implement e-learning across study centers with a fear of compromising the quality of education given to the students. The situation at MUBS is common to most educational institutions in developing countries where there are low levels of computer availability, access, familiarity and Internet penetration. This leads to skepticism about the feasibility of most e-learning projects (Abdon & Ninomiya, 2007) hence failure.

According to Kanovsky and Or-Bach (2001), integrating e-learning in HEIs should be done gradually because it involves several groups of interest like students, lecturers, technicians, policy makers among others. Several salient issues concerning costs, quality assurance, and organizational culture among others often emerge during the process.

Given that higher education forms the knowledge foundation for basic professional understanding and development of new skills for in-depth information acquisition, HEIs need to re-think their roles, revise their curricula according to changing demands and provide the services and methods of instruction that are demanded by their clientele. Higher educational institutions in developing countries are lagging behind in terms of benefiting from the immense opportunities that Information and Communication Technologies (ICTs) have brought to their counterparts in developed countries (Gauci & Nwuke, 2001). Universities in Eastern and Southern Africa are faced with challenges of inefficiency and ineffectiveness in higher education (Fine, 1997). This is as a result of the massive expansion of undergraduate enrolment and lack of enough space. Efforts to overcome these challenges have not been successful due to the persistent problems faced such as increasing demand and declining investments, brain drain, demoralizing conditions of service, and limited access to global knowledge bases (Fine, 1997).

Some of the current internet based software packages considered by HEIs include; Moodle, Blackboard, KEWL (Knowledge Environment for Web-based Learning) and WebCT which is used by the University of Stellenbosch in South Africa. Many of the platforms used for e-learning do not provide the flexibility that instructors need to support learning for a variety of students in various situations (Kanovsky & Or-Bach, 2001).

The use of ICT in HEIs has the potential to enhance the quality of teaching and learning. However, despite the existence of e-learning platforms, HEIs in developing countries have not fully optimized their use and benefits. This may be attributed to existence of barriers such as lack of appropriate frameworks that hinder successful integration of e-learning in education systems (Kituyi et al. 2012; Bada and Khazali, 2006; Sankale, 2006; Nodumo, 2007). Therefore, this study sought to develop a framework that can be used to address the barriers to successful integration of e-learning platforms in HEIs in Uganda and other developing countries.

According to Hornby (1995), a framework is a structure giving shape and support to something. In this study, the word "framework" refers to the recommended arrangement of selected concepts that HEIs can apply to address the barriers to e-learning integration in their institutions. The specific objectives of the study were to;

1. To study the current e-learning integration situation in HEIs;
2. To establish the requirements for developing a framework for e-learning integration;
3. To design a framework for integrating e-learning in HEIs and;
4. To test and validate the framework for integrating e-learning in HEIs.

Thus the following research questions were used:

1. What is the current state of e-learning integration situation in HEIs?
2. What are the requirements for developing a framework for e-learning integration?
3. How can a framework for integrating e-learning in HEIs be designed?
4. Is the designed framework for integrating e-learning in HEIs applicable?

## LITERATURE REVIEW

### E-learning in Uganda HEIs

As a result of Universal Primary Education (UPE) and Universal Secondary Education (USE), students' enrolment has doubled in the last decade. Secondary schools now have to accommodate the drastic increases in student numbers (Kisambira, 2007). These numbers have ended up in several HEIs hence the heavy pressure on limited resources that these institutions have. To ensure that the increasing numbers of students get quality education, new and innovative ways to improve the quality of teaching and teaching materials are being sought. One of these innovative ways is e-learning. At Kyambogo University for example, there have been initiatives to produce ICT-based Educational Content with support from the International Institute for Communication and Development (IICD) and The Ministry of Education and Sports. Such initiatives have helped improve the quality of teaching at HEIs (Kisambira, 2007).

From their study, Bada and Khazali, (2006) observed that most HEIs in Uganda such as Makerere University, Kampala International University, Kyambogo University, Makerere University Business School and Nkumba University have websites and they use wireless technology for internet connectivity. Most students are interested in e-learning, have access to internet and email and can use them very well. Most HEIs use the distance learning approach as one of the methods for degree courses, especially where students work and have little time to attend classes. The introduction of e-learning in HEIs should not totally take over from the traditional means of delivery. E-learning should be used to compliment the traditional means. This view is supported by Bada and Khazali, (2006) who argue that online methods of content delivery should be blended with the traditional methods of learning. However, Ugandan institutions face several challenges whenever they try to use blended learning. For example there is lack of vision and poor management, lack of a clear integration framework, bandwidth limitation, resistance to change, inadequate training of staff, poor infrastructure and high software costs. In addition to that, recognition of e-learning as a feasible method of learning is also still a challenge. This is affirmed by Bada and Khazali, (2006) indicating that the stakeholders believe face-to-face learning allows students to interact more with their instructors and also that there is more value for money.

### E-learning Experiences from Selected Countries in African

#### *E-learning Activities in Kenya*

Kenya realized the importance of ICT in education, and as a result, the government set up ICT structures at all levels of education in order to build an ICT-literate community (Sankale, 2006). The country's ICT policy aims at creating an e-enabled and knowledge-based society by the year 2015. In order to become a learning economy, the Kenyan government introduced the e-learning policy. This aimed at bringing about a paradigm shift in formal education to promote lifelong learning. It was noted that establishing an E-Learning Center (ELC) would be beneficial to the users. For example, the instructors learn ICT skills needed to develop, customize and deliver quality content through skills training and capacity building (Sankale, 2006). However, many challenges were faced in establishing the ELC. These were; inadequate funding, operating in a complex and challenging environment and misunderstanding of roles and functions of the ELC (Sankale, 2006).

#### *E-learning at Africa University, Zimbabwe*

The University appreciates how developments and application of ICTs to higher education have rapidly transformed the delivery of education to remote places and hence started an e-learning project. Nodumo (2007) reports that the e-learning project at Africa University has resulted in numerous benefits e.g. increased quality in service delivery, academic staff is motivated in their

jobs, the project has improved the image of the university. The e-learning project is also a good marketing strategy for attracting new students.

However some challenges were faced at the beginning, so the university realized the need for creativity, innovativeness, proactive approach and adoption of teaching methods that are flexible enough to accommodate a diverse student body.

## **FRAMEWORKS FOR INTEGRATING E-LEARNING IN HEIS**

### **The E-Learning Framework**

Designing an e-learning framework needs careful analysis and investigation of the resources available to the institution. Khan (2003) asserts that design, development, implementation and evaluation of e-learning systems require thoughtful analysis and investigation of how to use the attributes and resources of the Internet and digital technologies. Khan further reflects on various factors important to e-learning. He identified the following factors that cover various online learning issues; pedagogical, technological, interface design, evaluation, management, resource support, ethical and institutional. These factors discussed in the eight dimensions of the framework can provide guidance in the design, development, delivery and evaluation of e-learning environments.

Another useful framework is a model for developing an integrated e-learning culture in a large organization by Newton and Ellis (2006). The integration of e-learning is influenced by the various activities relating to e-learning. These are organizational priorities, learning environment, instructors' roles and learners' needs for developing an integrated e-learning culture in a large organization. All the four factors should be considered so that the extent of e-learning integration suits the organization that wants to embrace e-learning integration. This is important because different organizations have different priorities, different learning environments, different roles and different needs. In addition to the four factors of integrating e-learning, Newton and Ellis (2006) suggest that the policy makers' views should also be considered.

The above reviewed e-learning frameworks have been used to solve unique e-learning problems. Nevertheless, these frameworks do not address the issue of e-learning integration with other teaching methods in its entirety. They mainly cover issues of e-learning systems development, application and adoption.

## **E-LEARNING INTEGRATION THEORIES**

Although some scholars have argued that the requirements for face-to-face learning are the same as those for e-learning (e.g. see Díaz, 2009), and that the difference is only manifested in the effort put in by teachers, a number of scholars have argued otherwise (e.g. Kituyi & Kyeyune, 2012; Bada & Khazali, 2006; Sankale, 2006). In order to deepen the understanding on the subject of e-learning integration, some e-learning integration theories were consulted as seen in the following sub-sections:

### **Design Theory of Blended Learning**

Designed by Huang et al (2007), the Design Theory of Blended Learning tries to explain how different types of learning including face-to-face and computer aided forms of learning can be used together for better performance. They argue that blended learning can be achieved if there is a well designed curriculum showing the various activities involved in the learning process. In

this theory, the proponents suggest various factors that influence the success of blended learning as flexibility, whereby a number of tools such as discussion forums, e-mails and boards are used to enhance learning. In addition, the authors argue that technology based learning allows learners to undergo self-paced learning and monitor themselves without the direct supervision of the teacher. Therefore learners using blended learning are provided with a variety of learning options from which they can adopt effective learning processes.

However, for successful blended learning to occur there should be a series of activities executed through four phases, including pre-analysis, design of activities and resources, instructional assessment, and instructional verification. The analysis phase is aimed at studying the learners' characteristics, objectives and learning environment. In the design phase, the blended learning implementing institutions are supposed to come up with the overall design of the learning process, clearly showing the learning units, delivery strategies and required resources. In the instructional assessment phase, the implementing institution is supposed to carry out an evaluation of the learning process, curriculum evaluation, and evaluation of the learning activities identified in phase two. The deliverables of blended learning theory include the analysis report, design report, and evaluation report in each phase respectively.

### **Criticism of the Design Theory of Blended Learning**

Generally, there is little literature that evaluates blended learning studies. This is perhaps because blended learning is a relatively new issue that has not yet attracted as much attention as other research areas. However, some scholars such as Hadjerrouit (2008) have argued against blended learning. In his 2008 paper, Hadjerrouit (2008) argues that "blending face-to-face learning with information technologies cannot provide effective teaching and efficient solutions for learning". Further, Díaz (2009) argues that there is no significant difference between face-to-face and online learning. Nonetheless, Hadjerrouit (2008) suggests that blended learning can be effective if research is conducted with an aim of developing appropriate pedagogy and in effect proposes a model through which blended learning can be implemented. The "successive cycle" model can help remove shortfalls in the process of integrating learning i.e. face-to-face learning, computer-based learning and online learning.

In addition to the above, the blended learning theory is limited in a number of ways. For example the model does not show the learning content for which different learning methods are designed. In fact, there is no mention of content design at all in the design phase. The various learning methods to be used in blended learning are unknown. None of the reviewed models (Huang et al. 2007; Hadjerrouit, 2008) did identify the relevant stakeholders for successful blended or integrated learning. Moreover Kituyi et al. (2012) argue that stakeholders must be identified and each given specific roles for successful e-learning to take place. Kituyi et al. (2012) identified the five most important stakeholders for e-learning as the government, the school, the private sector, the teacher and the learner.

Despite the weaknesses identified above, blended learning remains a method of choice for better teaching in HEIs (Carman, 2005). Therefore, it is important that appropriate frameworks are designed to guide the integration of various teaching methods in the learning process. Blended learning theory is a good initiative towards integration of learning, although it does not show how each learning method integrates with others as is the case of (Hadjerrouit, 2008) which highlights face-to-face, computer-based and online learning as the components of blended learning. The only and perhaps the most significant weakness of blended learning model by Hadjerrouit (2008) is the lack of activities, stakeholders and key deliverables of each component listed in the model.

## RESEARCH DESIGN

A quantitative research design was used in the study. This was mainly because of the large number of respondents that participated in the study. Therefore, quantitative research methods were used to collect and analyze the data.

The study, which took approximately 3 months, was conducted through the following phases: Concept formulation, proposal writing, proposal review and approval; data collection, analysis and interpretation and presentation of findings. The questionnaire was designed to cover all the constructs of the blended theory. Prior to administering the questionnaire, validity and reliability tests were conducted as seen in Table 3 to ensure it was reliable and valid. The questionnaire was self-administered by the researchers. Where the respondents did not understand the questions, a clarification was made to them before they answered such questions. Self-administration of the questionnaire was done deliberately in order to attain a good response rate.

A sample of 341 respondents (staff and students) was selected from the five participating HEIs using Krejcie and Morgan's (1970) table of determining sample sizes. These institutions included Makerere University, Nkumba University, Makerere University Business School, Kampala International University and Kyambogo University. These are the top five universities in Uganda and had started using e-learning. Table 1 shows the study sample size.

On the other hand, descriptive statistics (means, frequencies and percentages) were used to analyze the data. The researchers used descriptive statistics because they are easy to understand and interpret even with little knowledge of statistics.

**Table 1:** Sample size

University	Sample		Total
	Students	Staff	
Makerere University	80	20	100
Kampala International University	50	10	60
Kyambogo University	60	15	75
Makerere University Business School	64	16	80
Nkumba University	20	6	26
<b>Total</b>	<b>274</b>	<b>67</b>	<b>341</b>

### Design of the Framework

The structure of the framework was largely based on blended learning design theory advanced by Hadjerrouit (2008) and some of the constructs of the technology acceptance model of Davis et al. (1989). Framework variables were picked from both literature and primary data. The relevant frameworks picked from the literature that guided the development of this framework included 1) The blended learning design theory (Hadjerrouit, 2008) 2) Stakeholder Roles for Sustainable e-learning (Kituyi et al. 2012) and the Technology Acceptance Model (Davis et al. 1989).

On the other hand, the requirements and other factors that influenced successful integration of e-learning as suggested by respondents in primary data were used to come up with the new e-learning integration framework. A detailed explanation of requirements is presented later in this paper.

## Validation of the Framework

Validation is the procedure of checking whether the framework is applicable or not. To validate the framework, a sample of 50 respondents was selected from all the participating universities using purposive sampling method. Five students and five staff members were picked from each university to respond to the validation questionnaire. This sample was in line with Roscoe's 1971 rule of thumb that any sample size ranging from 30-500 is considered to be adequate and representative of the population. Table 2 presents the validation sample:

**Table 2:** Validation sample

University	Sample		Total
	Students	Staff	
Makerere University	5	5	10
Kampala International University	5	5	10
Kyambogo University	5	5	10
Makerere University Business School	5	5	10
Nkumba University	5	5	10
<b>Total</b>	<b>25</b>	<b>25</b>	<b>50</b>

A total of 36 validation questionnaires were returned and analyzed. This means a 72% response rate was achieved. Validation findings are presented later in the paper.

## RESEARCH FINDINGS

### Validity and Reliability Results

Data were generated to test for the reliability and validity of the research instrument as seen in Table 3.

**Table 3:** Validity and Reliability Results

Variable	Items	CAC (reliability)	CVI (validity)
e-learning platforms capabilities	10	0.803	0.703
e-learning vs. conventional learning activities	8	0.736	0.687
e-learning vs. conventional learning benefits	6	0.751	0.771
Barriers to e-learning integration	5	0.735	0.678
Solutions to e-learning integration barriers	5	0.712	0.603
Requirements for e-learning integration	9	0.775	0.689

Results in Table 3 indicate that the questionnaire was reliable and valid since all variables scored a Content Validity Index above 0.6 and Cronbach Alpha's Coefficient above 0.7 were achieved (Rudner & Schafer, 2001; Kane, 2001).

### Designation of respondents

Data were generated to determine the designation of respondents as seen in Table 4.

**Table 4:** Respondents' designation

	<b>Designation</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	Teaching Assistant	8	3.0	3.0	3.0
	Assistant Lecturer	23	8.6	8.6	11.7
	Lecturer	8	3.0	3.0	14.7
	Senior Lecturer	3	1.1	1.1	15.8
	Ass. Professor	1	0.4	0.4	16.2
	Professor	0	0.0	0.0	16.2
	IT staff	2	0.8	0.8	16.9
	Student	221	83.1	83.1	100.0
	<b>Total</b>	<b>266</b>	<b>100.0</b>	<b>100.0</b>	

The results in Table 4 show that the majority of respondents were Students and Assistant Lecturers with frequencies 221 and =23 respectively. This was followed by Teaching Assistants and Lecturers (freq= 8). Senior Lecturers, Associate Professors and IT staff were the least represented with frequencies 3, 1 and 2 respectively. No Professors participated in the study. .

### Capabilities of the e-learning platform

Respondents were asked about the capabilities of their e-learning platforms. Descriptive means were used to analyze the data on a five point Likert scale, where a mean close to 1 implied strong disagreement while a mean close to 5 implied strong agreement. Table 5 presents the findings.

**Table 5:** Capabilities of the e-learning platform

<b>Capabilities</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Deviation</b>
Audio learning	2	5	1.44	.21
Video learning	1	5	1.78	.50
Discussion forums	3	5	4.43	.00
Instant messaging	1	5	2.48	.38
Content management	2	5	3.04	.41
Bulletin boards	1	5	4.78	.06
Chartrooms	1	5	4.03	.08
Games and leisure	1	4	2.48	.14
Engaging quizzes	1	4	2.30	.79
E-mail	2	5	4.52	.30



Results from primary data in Table 5 show that respondents strongly agreed that their e-learning platforms supported discussion forums (mean = 4.43), bulletin boards (mean = 4.78), chatrooms (mean=4.03) and e-mail (mean=4.52) capabilities. The respondents were uncertain if their e-learning platforms had content management capabilities.

The respondents however strongly disagreed that their e-learning platforms had audio learning (mean = 1.44), video learning (mean = 1.78), instant messaging (mean = 2.48), games and leisure (mean = 2.48) and engaging quizzes (mean = 2.30) capabilities.

### Requirements for e-learning integration

Data were collected on the requirements for e-learning integration and analyzed. The results in Table 6 show that respondents strongly agreed that the requirements for integration of e-learning and other learning methods are; use of projectors (mean = 4.85); use of e-learning for lectures and face-to-face for tests and exams (mean = 4.84); harmonizing course content for e-learning and face-to-face during design phase (mean = 4.87); incorporating 3D pictures in face-to-face lecturers (mean = 4.56); use of videos to improve long distance students learning experiences (mean = 4.72); use of audio tapes to play lectures in face-face classes to improve students' learning experiences (mean = 4.69); use of guest lecturers (mean = 4.89); use of textbooks and other reading materials before starting online lectures (mean = 4.66); training learners on how to use e-learning systems before they start courses (mean = 4.75).

**Table 6:** Requirements for e-learning integration

Requirement	Min	Max	Mean	Std. Deviation
Use of projectors	1	5	4.85	.81
E-learning methods should be used for lectures while tests and exams should be conducted using face-to-face methods.	3	5	4.84	.34
The course content should be harmonized design phase to allow so that it can be used in both e-learning and face-to-face methods	1	5	4.87	.78
Incorporate 3D pictures in face-to-face lecturers	2	5	4.56	.97
Use videos to improve long distance students learning experiences	2	5	4.72	.92
Use audio tapes to play lectures in face-face classes to improve students' learning experiences	1	5	4.69	.21
Guest lecturers should be invited for face-to-face interactions with students on topics that were covered online	1	5	4.89	.72
Text books and other reading materials should be provided to learners in advance before they start online lectures	1	5	4.66	.53
Learners should be trained on how to use e-learning systems before they start courses	1	4	4.75	.85

### Stakeholders for e-learning integration

Data were also generated to identify the key stakeholders for successful integration of e-learning in HEIs. Table 7 shows the findings:

**Table 7:** Stakeholders for e-learning integration

Stakeholder	Min	Max	Mean	Std. Deviation
Universities	1	5	4.77	.12
Government	1	5	4.65	.32
Lecturers	1	5	4.75	.13
Students	1	5	4.62	.14
Private sector	1	5	4.44	.01

Results in Table 7 indicate that the respondents strongly agreed that universities (mean = 4.77), the government (mean = 4.65), lectures (mean = 4.75), students (mean = 4.62) and the private sector (mean = 4.44) were key stakeholders for successful integration of e-learning by HEIs in Uganda.

## DISCUSSION ON FINDINGS

### E-learning information system capabilities

The findings indicate that the e-learning platforms HEIs were using did not support certain capabilities such as audio learning, video learning, instant messaging, games and leisure and engaging quizzes which are very important features for successful e-learning according to O'Donoghue *et al* (2003); Volery (2000); Sporn (1999); Fisser (2001). Because of these shortcomings, lecturers were not able to monitor students' continuous progress, mark tests and exams online in addition to conducting tutorials using the e-learning system. These findings help to reaffirm Raja (2004) who argues that if universities maintain a high quality of e-learning infrastructure, they are bound to maintain a competitive edge and thus enjoy greater levels of efficiency.

### Requirements for e-learning integration

The requirements for the integration of e-learning and other learning methods were identified as the use of projectors, mixing face-to-face and e-learning, harmonizing course content for e-learning and face-to-face during design phase and incorporation of 3D pictures in face-to-face. In addition, the use of videos, audio tapes, guest lecturers, textbooks and other reading materials and training were also suggested as requirements for successful integration of e-learning. These findings agree with Kanovsky and Or-Bach (2001); Raja (2004); O'Neill *et al*, (2004).

The findings as seen in Table 7 also agreed with Kituyi et al (2012) who identified the school (universities) student (learner), lecturers (teacher), government and the private sector as key stakeholders for successful e-learning integration.

## FRAMEWORK DEVELOPMENT

This section explains how the e-learning integration framework was developed and also how it can be applied. The section also shows the various theories, models and/or frameworks on the basis of which the e-learning framework was built.

### Framework variables

These were compiled from both literature and primary data as earlier explained. Table 8 shows the harmonized constructs, ideas and/or variables borrowed from literature and those suggested by respondents:

**Table 8:** Framework variables

Variable/idea/construct	Source
Use of projectors	Table 6
Mix e-learning for lectures; face-to-face for tests and exams	Table 6
Harmonized course content	Table 6
3D pictures in face-to-face lecturers	Table 6
Use of videos and audio tapes	Table 6
Use of guest lecturers	Table 6
Text books and other reading materials	Table 6
Training	Table 6
e-learning platform capabilities	Table 5
e-learning integration activities	Table 5
e-learning stakeholders	Kituyi et al. (2012)
e-learning stakeholder roles	Kituyi et al. (2012)
Perceived ease of use	Davis et al. (1989)
Perceived usefulness	Davis et al. (1989)
Blended learning activities	Huang et al. (2007)
Blended learning phases	Huang et al. (2007)
Blended learning deliverables	Huang et al. (2007)

### The e-learning integration framework

In this framework, e-learning integration can be achieved through three phases i.e. before integration, during integration and after integration. Before integration, a number of activities such as Analyze integration activities, Analyze user characteristics, Analyze learning objects, Analyze the learning environment, Identify learning methods, Compare alternatives, Prepare infrastructural budget, and Identify funding sources are carried out. The stakeholders responsible for performing the listed activities include the university, the lecturers and the students.

During the integration phase, a number of activities are carried out. These include implementation of face-to-face and e-learning strategies, after which, the two methods i.e. face-to-face activities with e-learning activities should be integrated. During integration the implementing universities should ensure that the following e-learning features are present in their e-learning platform (s);

Audio learning, Video learning, Discussion forums, Instant messaging, Content management, Bulletin boards, Chart rooms, Games for leisure, The stakeholders responsible for implementing these are the university, the lecturers, the student, the private sector and the government.

After integration, the following activities should be carried out to ensure that integrated systems work properly according to the plan in phase 1. These activities include evaluating integrated systems, evaluating students' performance, evaluation of lecturers' performance, technological improvements, evaluation of challenges, and continuous user training. The relevant stakeholders for implementing these activities include the university, the lecturers, the student, government, and the private sector.

Each of the above phases has a key deliverable; before integration activities yields into an integration plan; during integration, integrated teaching methods should be developed, while after integration, there should be an integration evaluation report. The relevant theories that guided these three processes are clearly explained by Kituyi et al. (2012); Kituyi and Kyeyune (2012). Figure 1 shows the e-learning integration framework.

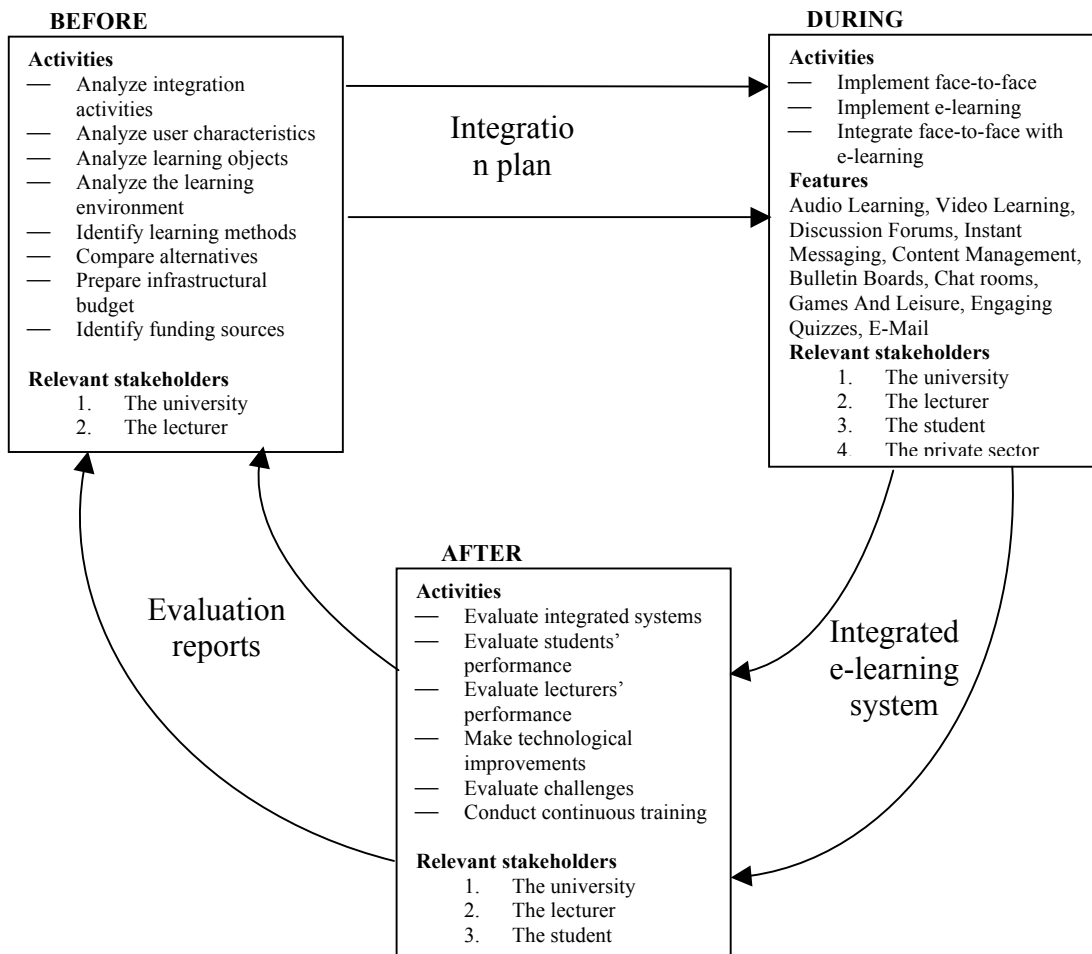


Figure 1: E-learning Integration Framework

## Implementation of the proposed framework

We use six scenarios to explain how the proposed e-learning integration framework can be implemented.

According to Kaira (2012), scenarios are used by system analysts to depict the role and activities that each stakeholder should play when implementing an artifact. Given that e-learning integration has a number of stakeholders namely; the university, the government, the private sector, the lecturer and the student, we use scenarios to show how they will fit into the integration process as follows:

### ***Scenario 1: the university initiates e-learning integration process***

The university is the main stakeholder in e-learning integration. It identifies a need for and initiates integration. Having realized a need for integration, the university puts in place a committee to plan for integration. The committee should identify the various activities that will be involved in the integration process and also identify the individual and/or organs that will support the execution of those activities. The university will also develop a budget and an implementation plan.

### ***Scenario 2: the university champions integration process***

As an originator, the primary role of the university integrating e-learning is spearheading and championing the implementation process. The university should mobilize resources for integration from the government, the private sector and other stakeholders. The university also ensures that users are equipped with the relevant knowledge, skills, software and hardware for successful integration.

### ***Scenario 3: the government sets a policy for integration***

Through its organs such as parliament and the ministry of education, the government plays a high level role of establishing a policy for e-learning integration and usage in schools. Once the policy is in place, the government can set up infrastructure such as provision of electricity, computer hardware and software that are necessary for integration. In addition, the government can plan for and support integration through training of trainers programmes in order to enhance capacity in universities.

### ***Scenario 4: the private sector provides technological support for integration***

Given that most technological innovations emerge from the private sector, the cardinal role of the private sector toward successful integration of e-learning is that of introducing new technologies and providing overall technical support that implementing universities may need. This could be in form of designing new course content and uploading it on integrated e-learning systems, making repairs and introducing new and more efficient e-learning technologies in universities.

### ***Scenario 5: the teacher teaches and evaluates students using an integrated system***

The teacher is a user whose role is to effectively utilize integrated e-learning systems to ensure maximum returns. To teach using integrated e-learning, the teacher will first have face-to-face lessons with students before they start using e-learning platforms. The teacher should at any given time use face-to-face to support e-learning, especially when handling practical components of the course. The teacher prepares teaching materials for both e-learning and face-to-face. E-learning materials are uploaded onto the e-learning platform, while face-to-face course materials can be given to students during face-to-face lessons. The teacher also evaluates students' performance using face-to-face methods. Therefore, appropriate evaluation materials e.g. question papers and answer sheets should be designed to suit face-to-face examination methods.

**Scenario 6: the student attends lessons and does assignments using an integrated system**

The student also falls under users group for e-learning integration. For the student using integrated e-learning, the lecturer will first teach them how to use the system. Thereafter, the student attends lessons and does tests and other assignments using the integrated system. The student should be able to use the e-learning system i.e. accessing it, downloading courseware and interacting with the lecturer as well as doing and submitting assignments via the e-learning system.

**VALIDATION RESULTS****Validation sample characteristics**

Data were generated to analyze the basic characteristics such as gender, designation and knowledge of e-learning to help understand the kind of people who validated the proposed framework. The results in Table 9 indicate that 21 respondents were students, while 15 were staff members. Of the 21 students, 13 were male and 8 were female. On the other hand, 12 staff members were male while 3 were female.

**Table 9: Validation sample characteristics**

Gender of respondent			Respondent Category		Total	
			Students	Staff		
Gender	Male	Count	13	12	25	
		Row %	52.0	48.0	100.0	
	Female	Count	8	3	11	
		Row %	72.7	27.3	100.0	
Total		Count	21	15	36	
		Row %	58.3	41.7	100.0	
Respondents knowledge of e-learning			Respondent Category		Total	
			Students	Staff		
Knowledge	Very knowledgeable	Count	3	8	11	
		Row %	27.3	72.7	100.0	
	Knowledgeable	Count	15	4	19	
		Row %	78.9	21.1	100.0	
	Somewhat knowledgeable	Count	2	2	4	
		Row %	50.0	50.0	100.0	
	Not knowledgeable	Count	1	1	2	
		Row %	50.0	50.0	100.0	
	Total		Count	21	15	36
			Row %	58.3	41.7	100.0

An analysis of respondents knowledge of e-learning showed that most respondents were knowledgeable about different learning methods (15 students and 4 staff members). 8 staff members were very knowledgeable about integrated e-learning. Only 1 student and 1 staff member were not knowledgeable about integrated e-learning.

### Applicability of the framework in HEIs

Data were collected to ascertain if the framework was applicable in HEIs as seen in Table 10:

**Table 10: Applicability of the framework**

	Response	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	88.9	88.9	88.9
	No	4	11.1	11.1	100.0
	<b>Total</b>	<b>36</b>	<b>100.0</b>	<b>100.0</b>	

Results in Table 10 show that most respondents (freq=32 representing 88.9%) approved of the framework and indicated that the e-learning framework was applicable in HEIs. Only 4 respondents representing 11% indicated otherwise.

## DISCUSSION AND CONCLUSION

This study has examined the various teaching and learning methods used by HEI i.e. face-to-face and e-learning. Although these two methods were found to be lacking in a number of aspects if treated separately, the study findings indicated that the methods can perform better if integrated. The requirements for e-learning integration and most applicable feature of e-learning information systems were identified. Several stakeholders for e-learning integration have also been examined.

The study has put forward a framework that can help improve e-learning integration in HEIs in developing countries. The framework can be used to guide HEIs management on which areas to concentrate in order to achieve the positive effects of e-learning in HEIs. The study puts emphasis on the infrastructure and the ICT skills that must be attained by management, lecturers and students of HEIs in developing countries. The developed framework was validated and validation results indicated that the framework was indeed applicable, if well implemented.

## RECOMMENDATIONS

The HEIs intending to introduce and integrate e-learning should first acquire and set up adequate ICT infrastructure in order to offer excellent e-learning platforms to the students and lecturers. In addition, management of HEIs should ensure that the infrastructure in place is upgraded periodically in order to match the changing technology. One way of achieving infrastructural requirements is through exploration of the various funding alternatives such as forming partnerships with governments and private sector players. This can help them to fundraise for necessary ICT infrastructure.

To overcome the problem of lack of knowledge, HEIs should train their personnel and hold workshops on using e-learning and other teaching methods such as face-to-face. Basic computer skills are needed so that lecturers and students will be able to produce e-learning media and use it effectively.

Finally, lecturers should be motivated to embrace the technology and to receive support in terms of time and guidance for uploading their material online for the students to access them.

### Areas for future research

While the study proposes an e-learning integration framework based on requirements collected in Uganda HEIs, the unit of study was limited to the selected HEIs. The majority of HEIs especially the private ones did not participate. It would be better to incorporate perceptions of a larger sample of the HEIs in Uganda to provide integrated perceptions and experiences of these institutions. The study can be extended to cover other institutions (primary and secondary schools). Most studies have focused on integrating e-learning but have not considered the e-learning approaches in place. The researchers therefore propose that research be carried out on the e-learning approaches available and their benefit to HEIs.

Further to the above, similar studies should be conducted in other countries to generate comparable data that is useful for coming up with more harmonized e-learning integration frameworks.

### REFERENCES

- Aguti J. N. 2002. "Facing up to the Challenge of Universal Primary Education, (UPE) in Uganda through Distance Teacher Education Programmes". *A Paper Presented at Pan Commonwealth Forum on Open Learning: Open Learning: Transforming Education for Development*
- Abdon B. R and Ninomiya S. 2007. "E-Learning in Higher Education Makes Its Debut in Cambodia: The Provincial Business Education Project". *The International Review of Research in Open and Distance Learning*, 8 (1).
- Bada, J. K. and Khazali. 2006. "An Empirical Study on Education Strategy to E-learning in a Developing Country". *Proceedings of the Fourth International Workshop on Technology for Education In Developing Countries*, 10-12 July 2006, Iringa, Tanzania.
- Carman J. M. 2005. "Blended Learning Design: Five Key Ingredients", *Agilant Learning*
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. 1989. "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models". *Management Science*
- Díaz Alonso, L., & Blázquez Entonado, F. 2009. "Are the Functions of Teachers in e-Learning and Face-to-Face Learning Environments Really Different?" *Educational Technology & Society*, 12 (4), 331–343.
- Fine, J.C. 1997. "Networks for Research & Learning: A Strategic Approach to Capacity Building in Sub-Saharan Africa". *Unpublished paper: Cross-National Capacity Building in Africa: Interventions that Work, Rockefeller Foundation, Bellagio, Italy, July 1997.*
- Fisser, P. 2001. "Using information and communication technology. A process of change in higher education". *Enschede: Twente University Press.*



- Gauci, A. and Nwuke, O. K. 2001. "Reforms in higher education and the use of information technology," *Issues in Higher Education, Economic Growth, and Information Technology*, Ad-hoc Expert Group Meeting (19-21 November), Nairobi, Kenya.
- Hadjerrout S. 2008. "Towards a Blended Learning Model for Teaching and Learning Computer Programming: A Case Study". *Informatics in Education*, 2008, Vol. 7, No. 2, 181–210 181
- Hornby, A. S., 1995. "Oxford Advanced Learner's Dictionary of Current English, Fifth Edition". *Oxford University Press, Oxford, New York*
- Huang R., Ding M., and Zhang H. 2007. "Towards a Design Theory of Blended Learning Curriculum". *Beijing Normal University*
- Kaira J. G. 2012, "MUELA: A generic web-based courseware content authoring system". An unpublished dissertation, *Makerere University*
- Kanovsky, I. and Or-Bach, R. 2001. "A Gradual Process for Integrating E-learning in a Higher Education Institute". *Teaching and Learning Models*, 0(2)107-111.
- Khan, B. 2003. "A framework for E-learning". Retrieved 10 May, 2008 from <http://www.bookstoread.com/framework/>
- Kisambira, E. 2007. "E-learning Face with Daunting Challenges in Uganda". Retrieved September 10, 2008 from <http://www.icconnect.online.org/Articles/elearningUganda2007/>
- Kituyi G. M. and R. Kyeyune 2012. "An Analysis of E-learning Information System Adoption in Ugandan Universities: Case of Makerere University Business School". *Information Technology Research Journal* Vol .2(1), pp. 1 – 7, April 2012
- Kituyi, G. M., Moya, M. and Kyeyune, R. 2012. "A Framework for Implementing Sustainable e-learning Information Systems in Developing Countries". *Journal of the Management University of Africa*, Vol VI, ISSN 2074-4730 Pg 223-228
- Krejcie, V and Morgan, W. (1970). "Determining Sample Size for Research Activities". *Educational and Psychological Measurement*, 1970. Retrieved 12th May, 2009 from [www.fns.usda.gov/fdd/processing/info/SalesVerificationTable.doc](http://www.fns.usda.gov/fdd/processing/info/SalesVerificationTable.doc)
- Newton, D. and Ellis, A. 2006. "A model for e-learning integration". *Proceedings of E-Learn 2006: World Conference on E-Learning in Corporate Government, Healthcare and Higher Education*, Association for the Advancement of Computing in Education, Honolulu, Hawaii.
- Nodumo D. 2007. "Implementing electronic learning in an institution of Higher Education: Case of Africa University". *Africa University*
- O'Donoghue, J., Singh, G., and Worton H. 2003. "A study into the effects of e-learning on Higher Education". *Journal of University Teaching and Learning Practice*3, pp 13-24.
- O'Neill, K., Singh, G., and O'Donoghue, J. 2004. "Implementing e-learning Programmes for Higher Education: A Review of the Literature". *Journal of Information Technology Education* 3, 313-323.

Raja M. and H. Raja. 2004. "E-learning in Higher Education Institutions in Malaysia.5 (7), (online edition)". Retrieved in October 2009 from [http://www.e-mentor.edu.pl/\\_xml/wydania/7/102.pdf](http://www.e-mentor.edu.pl/_xml/wydania/7/102.pdf)

Sankale, J. 2006. "E-Learning Activities for Kenya". *Kenya Ministry of education*. Retrieved October 27, 2008 from <http://www.checkpoint-elearning.com/article/2495.html>

Sporn, B. 1999. "Adaptive university structures. An analysis of adaptation to socioeconomic environments of US and European Universities". *London*.

Tusubira, F. F and Mulira, N. 2006. "Integration of ICT in Higher education Institutions: Challenges and best practice recommendations based on the experience of Makerere University and other organizations". Retrieved February 16, 2008 from <http://iucea.org/downloads/8.%20Integration%20of%20ICT%20in%20Higher%20Education%20Institutions.doc>

Volery, T. 2000. "Critical success factors in online education". *The International Journal of Educational Management*, 14(5), 216-223.

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