

How can e-learning integration be realized? An exploratory study in Higher Education Institutions

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ARTICLE INFO

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KeyWords: - e-learning, e-learning integration, teaching methods, Uganda

ABSTRACT

E-learning, which encompasses the use of technology and other computer enhanced learning methods, has been identified one way of delivering low cost and efficient education service in both developed and developing countries. These technologies have been adapted to support other methods of teaching in Higher Education Institutions (HEIs). However, despite efforts by many HEIs to integrate e-learning in their teaching processes, many of them have not succeeded or they have not obtained benefits from the e-learning due to barriers that limit the integration process.

This study was conducted to investigate the factors affecting the integration of e-learning with other teaching methods. To achieve this, five Higher Education Institutions in Uganda were purposively identified to participate in the study. A self-administered questionnaire was administered to a sample of 341 students and staff from the selected HEIs. Quantitative statistics including means, frequencies and percentages were used to analyze the data. The main barriers to integration of e-learning were identified as lack of knowledge, lack of resources and staff failure to adapt to new teaching technologies.

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INTRODUCTION

The emergences of new forms of competition have enabled traditional higher education institutions to change their modes of operation and delivery in order to take advantage of the opportunities offered by the new Information and Communication Technologies (ICT). Many higher education institutions have introduced the use of ICT in teaching, learning and research. Integration of ICTs enhances the quality of education by helping instructors to do their job better and by helping students to learn more effectively. One outstanding opportunity offered by ICT is E-learning. E-learning; a form of teaching which involves giving instructions using electronic media (Engelbrecht, 2003), has been found to enable easier and flexible teaching and learning to students across the globe. E-learning has enabled learners to set the pace at which learning should happen anywhere, anytime (Ndubisi, 2004). The recent advancements in web technologies have further fostered the uptake of e-learning by many academic institutions, notably universities and other higher education institutions (Waight et al, 2002). Surry *et al.* (2005) argue that the increased number of HEIs that have embraced this technology has in the process turned around and improved its capabilities in teaching.

However, amidst these developments, a number of universities and other education institutions have had

some bottlenecks with the technology (Mungania, 2003). Kituyi and Kyeyune (2012) for example identify knowledge, lack of resources and resistance to change by faculty as the main obstacles for successful adoption of e-learning in universities. In addition to resources and staff obstacles, many e-learning systems have failed to fully integrate with existing teaching approaches. Surry *et al.* (2005) argues that the lack of technological and pedagogical knowledge, lack of technical support, lack of administrative and policy support, and low motivation of faculties have made it difficult to use e-learning technologies in most education institutions. Surry *et al.* (2005) further argue that although e-learning has registered some success in some education institutions, e-learning integration remains a challenge. The factors influencing e-learning integration are at large. Therefore, this study sought to identify the factors the affected the integration of e-learning so as to make recommendations for successful integration of e-learning. Specifically, the study explored the teaching and learning methods used by higher education institutions in Uganda and identify the barriers limiting the integration of e-learning in HEIs in Uganda.

Definition of key theoretical terms

E-learning has been defined by scholars in different ways.

Some schools of thought define e-learning as distance learning, online learning and/or networked learning (Wilson, 2001). As has already been stated, Engelbrecht (2003) defines e-learning as instructions delivered via electronic media. Simplistic thinkers define e-learning as computer enhanced learning. However, Shoniregun and Gray (2004) argue that e-learning as a form of teaching involves electronic content development, pedagogy, teaching and administration of course assignments over distant locations without compromising on the set academic standards. According to Littlejohn (2007), e-learning means using ICT as mediating devices that allow students to access learning resources. If well designed and implemented, an e-learning platform can go a long way in facilitating knowledge sharing, knowledge management and above all provide access to quality educational services cheaply to masses. In this study, e-learning is defined as the learning method that uses ICTs to transform and support the teaching and learning process in Higher Education Institutions. Therefore, the forms of learning that make use of devices such as desktops, laptops, mobile phones, projectors, and other computer technologies to deliver learning activities over a distant location comprised part of the study.

On the hand, **integration** is the process of combining different learning methods so that they support one another and work together to meet given objectives. In this study various ways of combining e-learning with the traditional teaching methods were explored to enhance teaching in HEIs.

Higher Education (HE) is the education provided by a college, institute or university. The American Heritage Dictionary of the English Language **defines higher education as**; Education beyond the secondary level, especially education at the college or university level. In this study, HE was considered to be a form of education undertaken at university level. Therefore, **Higher Education Institutions (HEIs)** were defined as those institutions that provided higher education. Higher education in Uganda comprises of all types of post-secondary level institutions of advanced learning, mainly in the form of universities, institutes, polytechnics and colleges and other tertiary institutions. However the study looked at universities as higher educational institutions.

The Case for Technology Acceptance Model

To further understand the adoption and integration problem to e-learning, we used Davis *et al.* (1989) Technology Acceptance Model (TAM) since e-learning is a new technology and is largely perceived as an innovation in education in many developing countries. According to Malhotra and Galletta (1999), TAM was developed with an aim of explaining how people adopt to computer usage. Davis *et al.* (1989) in their model argue that adoption to new technologies is influenced by external factors that affect perceived usefulness and perceived ease of use of a given computer technology. They further argue that once users perceive a given technology as being useful and that

also that once the users perceive that the technological innovation as being easy to use, then, they will develop a positive attitude towards such technology. This translates into intention to use and eventually actual usage of the technology.

Limitations of TAM

While it is true that perceived ease of use and perceived usefulness of technology affects attitude and actual usage of a new technology, this study finds that the model does not indicate the various stakeholders responsible for; 1) introducing the external variables in the model, 2) carrying out the activities that increase perceived usefulness such as sensitization and 3) activities that increase perceived ease of use such as training of users. In addition, the model does not indicate the stakeholders whose attitudes are affected by perceived ease of use and perceived usefulness (see Kituyi *et al.* 2012). Above all the model does not show who the actual users of such new technologies are.

Research approach

A survey research approach was used in this study. Quantitative research methods were used to collect and analyze data. A questionnaire was designed, tested and used to collect primary data from respondents selected from five Higher Education Institutions operating in Uganda.

Study Population

Respondents were identified from different Higher Education Institutions. Five institutions were covered namely; Makerere University, Makerere University Business School (MUBS), Kyambogo University, Kampala International University and Nkumba University. These HEIs were chosen because they had to a certain extent integrated e-learning in their operations.

Sampling Procedure

Purposive sampling method was used to select the HEIs and respondents from each of the institutions. This was done because there was need to involve only those HEIs that had tried to integrate e-learning with other teaching methods and also to select the most competent respondents from each of the institutions in order to get relevant data. This is in line with Berg (2004) who argues that purposive sampling enables the researcher to use special knowledge and expertise in selecting specific groups or subjects that appropriately represent the population.

According to Cavusgil and Das (1997), errors at the sampling design stage can put at a risk the resultant stages in the research design. If the errors are detected in time, they can be corrected. Therefore it was important to come with an appropriate sample for this study.

A sample size was selected using Kjericie & Morgan's (1970) sample size table. The Sample size was influenced by the time available, the budget and necessary degree of precision. The sample size needed was a function of the confidence interval of (+/-) 5%, a confidence level of 95%, and the population size of 1500 competent respondents

from the five HEIs. Therefore, using Morgan's table, a population of 3000 yielded into 341 sample size. These

were divided among the five selected universities as seen in table 1:

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
Total	274	67	341

Out of the 341 sample size above, 284 questionnaires were returned, implying 83% response rate. However, some 18 questionnaires were found to be incomplete and others inconsistent in the way questions were answered. These were therefore removed from the analysis. Consequently, 266 questionnaires representing 78% of the sample were analyzed. Even after the removal of 18 questionnaires, the 266 (78%) was still adequate for the study results to be representative of the population.

Methods of data collection

Data were collected using self-administered questionnaires which had close ended questions and a few open ended questions. The questionnaires were administered to students, lecturers and staff members in IT departments of the selected HEIs. Questionnaire method was preferred because the target sample was large. The method was also preferred for its merits advanced by (Gillham, 2000), which include management of resources, cost and time. The researchers were guided by the blended learning design theory (Huang et al. 2007; Hadjerrouit, 2008), stakeholder roles for sustainable e-learning (Kituyi et al. 2012) and Technology Acceptance Model (1989) in the creation of the questionnaire.

Quality of the research tool

The questionnaires were checked for reliability and content validity before distribution to respondents. Content Validity Index (CVI) was used to test for validity of the questionnaire. According to Kane (2001), validity tests ensure that research instruments measure what they are intended to measure originally. Content Validity Index (CVI) was used to test for validity of the questionnaire as seen in Table 2.

On the other hand, reliability is "the extent to which the measurements resulting from a test are the result of characteristics of those being measured" (Rudner and Schafer, 2001). Kane (2001) also argues reliability tests

ensure that the findings of the study can be relied on as a whole representation of facts on the ground. Reliability was ensured through the pilot study. The first draft of the questionnaire was checked by an independent but competent researcher in area of e-learning. The second draft was reviewed by a few staff in the faculty of Computing and Management Science at MUBS and changes were made subsequently. External validity was catered for through a good response of the sampled population in one of the participating HEIs-MUBS. A group of 30 respondents similar in characteristic to the intended sample population were used. The questionnaire was self-administered so as to avoid researcher intervention. The obtained results were found to be consistent. These results were compared with the results from the final data collection phase and were still found consistent. After the data collection exercise, the researchers interviewed a few respondents for reliability testing. This method is recommended by (Evenson et al, 2003).

Data coding and analysis

Data coding is assigning key numbers or values to each response to ease input while data analysis is the process of summarizing the data collected. Data collected was both quantitative and qualitative. The researchers designed simple codes to ease the entering and analysis of data. The respondents' opinions were numbered at ranges of 1 – 5 for the different sections. Thereafter the data were entered in SPSS and summarized as tables.

Findings

Validation results

As earlier stated, Content Validity Index (CVI) was used to test the questionnaire for validity. The test results indicated that the research instrument was valid. A Content Validity Index greater than 0.6 was achieved for all variables as seen in table 2:

Table 2: Validity results

Variable	Items	CVI
e-learning vs. conventional learning activities	8	0.687
Barriers to e-learning integration	5	0.678
Solutions to the better e-learning integration barriers	5	0.603

Data were gathered on the distribution of respondents across all the participating institutions, gender, designation and respondents' knowledge of e-learning. These were analyzed and presented as seen in tables 3, 4, 5 and 6:

Table 3: Distribution of respondents

		Category			
		Students	Staff	Total	
Institution	Makerere University	Count	67	13	80
		Row %	83.8	16.3	100.0
	Makerere University Business School	Count	55	14	69
		Row %	79.7	20.3	100.0
	Kampala International University	Count	35	5	40
		Row %	87.5	12.5	100.0
	Kyambogo University	Count	52	9	61
		Row %	85.2	14.8	100.0
	Nkumba University	Count	12	4	16
		Row %	75.0	25.0	100.0
Total	Count	221	45	266	
	Row %	83.1	16.9	100.0	

The results in table 3 show that the majority of the respondents were from Makerere University (freq=80), while those from Makerere University Business School, Kampala International University, Kyambogo University and Nkumba University were 69, 40, 61 and 16

respondents respectively. In addition, the majority of the respondents across all universities were students comprising 83.1%, compared to staff who contributed only 16.9%.

Table 4: Gender and respondent category

			Category		Total
			Students	Staff	
Gender	Male	Count	157	33	190
		Row %	82.6	17.4	100.0
	Female	Count	64	12	76
		Row %	84.2	15.8	100.0
Total	Count	221	45	266	
	Row %	83.1	16.9	100.0	

Results in the table 4 show that the majority of the respondents were male (freq=190) whereas females were 76.

Table 5: Designation

Designation	Frequency	Percent	Valid Percent	Cumulative Percent
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
Total	266	100.0	100.0	

Results in table 5 show that Teaching Assistants were 8, Assistant Lecturers were 23, Lecturers were 8, Senior Lecturers were 3, Ass. Professors were 1 and Professors were 0. IT staffs were 2 and Students were 221.

Table 6: Knowledge of e-learning

			Category		Total
			Students	Staff	
Knowledge	Very knowledgeable	Count	2	8	10
		Row %	20.0	80.0	100.0
	Knowledgeable	Count	15	25	40
		Row %	37.5	62.5	100.0
	Somewhat knowledgeable	Count	23	5	28
		Row %	82.1	17.9	100.0
	Not knowledgeable	Count	181	7	188
		Row %	96.3	3.7	100.0
Total		Count	221	45	266
		Row %	83.1	16.9	100.0

The results in table 6 show that 188 respondents were not knowledgeable about e-learning (freq=188). The majority of these (96.3%) were students. The same results show that most staff respondents were knowledgeable (freq=25), while only 8 were very knowledgeable.

The teaching and learning methods used by higher education institutions

Various aspects were used to explore the teaching and learning methods used by higher education institutions. These included existing learning methods; applicable learning methods; the people who used e-learning; existing e-learning platforms; capabilities of the existing e-learning platforms; activities performed using e-learning platforms; activities performed using conventional teaching and

Table 7: Existing Learning Methods

Learning method	Min	Max	Mean
Face-to-face teaching and learning	1	5	4.76
e-learning	1	5	4.01
Long distance learning	1	5	1.25
Blended learning	1	5	2.19

The respondents strongly agreed that they used face-to-face teaching and learning method in their universities (mean=4.76). The respondents also agreed that they used e-learning (mean=4.01).

The respondents however disagreed that they used long distance learning (mean=1.25) and blended learning (mean=2.19).

Table 8: Most applicable learning methods

learning methods; benefits realized from the use of e-learning; benefits realized from the use of conventional learning methods. The results were generated from a questionnaire which was ordered such that 5 represented Strongly Agree, 4 -Agree, 3-Uncertain, 2 - Disagree and 1 - Strongly Disagree. A mean close to 1 or 2 reflects disagreement, while one close to 4 or 5 shows agreement. A mean close to 3 shows Uncertainty. The findings from these analyses are presented as follows:

Existing learning methods

The results were generated in the table 7 to examine the current teaching and/or learning methods used by higher education institutions (HEIs).

Applicable Learning Methods

The respondents were also asked to indicate the most applicable teaching and learning methods in universities as seen in table 8.

Learning method	Min	Max	Mean
Face-to-face learning	1	5	4.82
e-learning	1	5	4.76
Long distance learning	1	5	2.33
Blended learning	1	5	4.66

Results generated in table 8 show that respondents strongly agreed that face-to-face (mean =4.82), e-learning (mean =4.76) and blended learning methods (mean =4.66) were most applicable in the universities. The respondents however disagreed that long distance

learning was applicable in the universities (mean=2.33).

E-learning platforms used

In the same breadth, statistics were generated to examine the various e-learning platforms being used by universities as seen in table 9:

Table 9: e-learning platforms used

e-learning platforms	Min	Max	Mean	Std. Deviation
Blackboard	2	5	2.44	.96
Moodle	1	5	4.78	.88
ETUDE	1	5	1.03	.89
KEWL	1	5	4.48	.89
WebCT	1	4	1.60	.91
MUELE	2	5	4.50	.97

Results in table 9 show that the respondents strongly agreed that their universities used Moodle, KEWL and MUELE with means 4.78, 4.48 and 4.50 respectively. The respondents strongly disagreed that universities used Blackboard (mean=2.44), ETUDE (mean=1.03), WebCT

(mean=1.60).

Activities Performed using the E-Learning Platform

Data were collected to examine the activities performed by lecturers and students over the e-learning platforms in place as seen in table 11.

Table 11: Activities performed

Activity	Min	Max	Mean	Std. Deviation
Students are taught using the e-learning system	1	5	4.86	.77
Students do tests and exams using the e-learning system	3	5	2.93	.80
Lecturers mark tests and exams using the e-learning system	1	5	1.24	.77
Lecturers manage students' results using the e-learning system	2	5	1.36	.79
Lecturers monitor students' continuous progress using the e-learning system	1	5	3.21	.68
Lecturers conduct and manage discussions using the e-learning system	1	5	4.14	.64
Lecturers carry out research using the e-learning system	1	4	1.55	.22
Lecturers conduct tutorials using the e-learning system	1	5	1.43	.45

The respondents strongly agreed that students are taught using the e-learning system (mean=4.86) and also that lecturers conduct and manage discussions using the e-learning system (mean=4.14). The respondents were uncertain whether students did tests and exams using the e-learning system (mean=2.93), and also whether lecturers

monitored students' continuous progress using the e-learning system (mean=3.21).

On the other hand, respondents strongly disagreed that lecturers marked tests and exams using the e-learning system (mean=1.24), lecturers managed students' results using the e-learning system (mean=1.36) and also that

lecturers carry out research using the e-learning system (mean=1.55). The respondents further disagreed that lecturers conducted tutorials using the e-learning system (mean=1.43).

Activities Performed Using Conventional Learning Methods

Similarly, data were collected on the activities performed in universities using conventional teaching methods as seen in table 12.

Table 12: Activities performed on conventional learning methods

Activity	Min	Max	Mean	Std. Deviation
Students are taught using conventional learning methods	1	5	4.96	.72
Students do tests and exams using conventional learning methods	1	5	4.55	.88
Lecturers mark tests and exams using conventional learning methods	1	5	4.44	.41
Lecturers manage students' results using conventional learning methods	3	5	4.56	.97
Lecturers monitor students' continuous progress using conventional learning methods	1	5	4.61	.02
Lecturers conduct and manage discussions using conventional learning methods	1	5	4.74	.27
Lecturers carry out research using conventional learning methods	1	4	4.65	.93
Lecturers conduct tutorials using conventional learning methods	2	5	4.48	.19

Results in table 12 indicate that respondents strongly agreed that students are taught using the e-learning system (mean=4.96), Students do tests and exams using conventional learning methods (mean=4.55) and also that lecturers mark tests and exams using conventional learning methods (mean=4.44). In addition, respondents strongly agreed that lecturers manage students' results using conventional learning methods (mean=4.56), Lecturers monitor students' continuous progress using conventional learning methods (mean=4.61) and also that Lecturers

conduct and manage discussions using conventional learning methods (mean=4.74. further to these, respondents strongly agreed that lecturers carry out research using conventional learning methods (mean=4.65) and also that Lecturers conduct tutorials using conventional learning methods (mean=4.48).

Benefits of E-Learning

Statistics were also generated to examine the benefits of e-learning as seen in table 13:

Table 13: Benefits of E-Learning

Benefit	Min	Max	Mean	Std. Deviation
It is saves money	1	5	4.70	.14
It is more flexible	1	5	4.34	.21
Students learn at their own pace (self-paced learning)	1	5	4.48	.54
It has promoted good image for the university	1	5	4.44	.14
It has promoted knowledge sharing in this hospital	1	5	4.03	.27
There is better management of students' data	1	5	4.97	.22

Results in table 13 indicate that respondents strongly agreed that it is saves money (mean=4.70), it is more flexible (mean=4.34) and also that students learn at their own pace (self-paced learning) (mean=4.48). The respondents also strongly agreed that e-learning promoted good image for the university (mean=4.44), promoted knowledge sharing in this hospital (4.03) and also that there was better management of students' data (mean=4.97).

2..1 Benefits of conventional learning methods

Data were also collected about the benefits of conventional teaching methods in a bid to compare the two approaches as seen in table 14:

Table 14: Benefits of conventional learning methods

Benefit	Min	Max	Mean	Std. Deviation
There is more physical interaction	1	5	4.65	.12
Personal attachment to the lecturer	1	5	4.67	.73
Interaction between students creates a more conducive environment for learning	1	5	4.77	.49
It promotes teamwork	1	5	4.68	.62
Students are more committed to learning	1	5	4.77	.52
Assignments are done and submitted in time	1	5	4.65	.43

Results in table 14 indicated that respondents strongly agreed that conventional learning methods led to more physical interaction (mean=4.65), encouraged personal attachment to the lecturer between learners and lecturers (mean=4.67) and also that it encouraged interaction between students creates a more conducive environment for learning (mean=4.77). In addition, respondents strongly agreed that conventional learning methods promoted

teamwork among students (mean=4.68), made students more committed to learning (mean=4.77) and also that assignments are done and submitted in time (mean=4.65).

Barriers to e-learning integration in HEIs

Data were collected in order to examine the barriers that limited integration of e-learning and other teaching methods in universities. Descriptive (means) were used to analyze the data as seen table 15.

Table 15: Barriers to e-learning integration

Barrier	Min	Max	Mean	Std. Deviation
Staff members do not want use e-learning	1	5	4.55	.18
Staff members are not knowledgeable about e-learning	1	5	4.58	.22
We can not afford e-learning	1	5	4.48	.34
Our students do not want to use e-learning	1	5	4.64	.04
Our students are not knowledgeable about e-learning	1	5	4.63	.23

The respondents in table 15 strongly agreed that the barrier to e-learning integration were; Staff members did not want use e-learning (mean=4.55), Staff members were not knowledgeable about e-learning (mean=4.58) and also that they could not afford e-learning (4.48). The respondents further agreed that students did not want to

use e-learning (4.64) and also that students were not knowledgeable about e-learning (mean=4.63).

Solutions to e-learning integration barriers

Suggested solutions to e-learning integration barriers were collected and analyzed using descriptive statistics as seen in table 16:

Table 16: Solutions to e-learning integration barriers

Solution	Min	Max	Mean	Std. Deviation
Lecturers and students should be sensitized about the benefits of e-learning	1	5	4.66	.01
Lecturers and students should be trained about e-learning	1	5	4.78	.04
Improve technology infrastructure	1	5	4.48	.12
Source for funding to purchase more computers	1	5	4.54	.07

Improve internet speed	1	5	4.83	.08
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Results in table 16 show that respondents strongly agreed that Lecturers and students should be sensitized about the benefits of e-learning (mean=4.66), Lecturers and students should be trained about e-learning (mean=4.78) and also that technology infrastructure should be improved for better e-learning integration. The respondents further agreed that there should be Sourcing for funds to purchase more computers (mean=4.54) and improve internet speed (mean=4.83).

Discussion of findings

This section presents a discussion of findings, while relating findings to literature.

Teaching and learning methods used by higher education institutions

Findings on learning/teaching methods revealed that universities predominantly used face-to-face and to certain extent e-learning. These findings are in line with Kituyi and Kyeyune (2012). The findings further agreed with Kituyi and Kyeyune (2012) who argued that Ugandan universities used Moodle, KEWL and MUELE as the main e-learning platforms. The reasons given for the use of e-learning by universities i.e. cost saving, convenience, global reach and flexibility among others were all in line with literature (eg see Stamatis *et al*, 1999; Kruse, 2004; Hamburg *et al*. 2003; O'Donoghue *et al*. 2003; Volery, 2000; Sporn, 1999; Fisser, 2001; Wende and Van der Ven, 2003).

On the other hand, findings disregarded long distance learning method as being used and applicable in universities. This finding is in disagreement with some of the proponents of long distance learning. For example, Mugaba (2002) had argued that long distance learning was one of the most effective learning strategies adopted by universities to address population pressure on the physical infrastructures in universities.

Barriers to e-learning integration

Findings identified the barriers to e-learning integration as refusal by staff members to use e-learning because they were not knowledgeable about the technology. The staff members also could not afford e-learning as it was very expensive. These barriers equally applied to students. Kituyi and Kyeyune (2012) had emphasized that knowledge and lack of resources were the main hindrances to e-learning adoption. In addition, these findings are in agreement with Bada and Khazali (2006) who identifies the given barriers as those affecting HEIs in their attempt to integrate e-learning. The findings can also be attributed to Takalani's study which identified lack of resources as one of the barriers to e-learning in African HEIs (Takalani, 2008).

Conclusion and recommendations

The integration of e-learning has become important as the environment in which HEIs operate keeps changing from

time to time. This calls for better ways of delivery. The findings have shown that there is need to integrate e-learning in HEIs in order to cater for the dynamics in higher education. Further to this, there is an increase of students enrolling on evening programmes. Many of these students are working class and may not get the time to attend all the lectures, thus the need for e-learning integration. The findings have also shown that there is a need for collaboration from individuals, institutions, researchers and all stakeholders to join the fight against the barriers to e-learning integration in HEIs which are enormous and in every aspect of life, like social, technological, political, and financial.

As HEIs integrate e-learning, they should first acquire sufficient ICT infrastructure to enable them offer excellent e-learning platforms to the students, lecturers and management. This development is supported by Raja (2004) as she mentions that most HEIs in Malaysia have sufficient ICT infrastructure to offer excellent e-learning platforms. Therefore, management of universities should explore the various means that can be exploited to raise the resources for instance forming partnerships with government and the private sector. This can help them to fundraise as well so that they get the necessary ICT infrastructure.

The personnel in charge of setting up e-learning platforms should ensure that they create awareness of such services to the lecturers and students and also promote the relevance of e-learning to the institution. This could be done through sensitization workshops or seminars and by making the e-learning platforms user friendly such that the users become familiar with the system.

Finally, to overcome the problem of lack of knowledge, higher education institutions should conduct trainings for their personnel and hold workshops on using e-learning and other teaching methods such as face-to-face. Basic computer skills are need so that lecturers and students will be able to produce and use e-learning systems effectively and efficiently.

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