

Evaluation of E-Learning Management Systems by Lecturers and Students in Ugandan Universities: A Case of Muni University

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ABSTRACT: The use of eLearning is increasing dramatically in Uganda, and most of institutions invest huge amounts in developing and deploying eLearning systems. As far as Learning Management System is concerned, it offers an integrated platform for educational materials, distribution and management of learning as well as accessibility by a range of users including lecturers, students and content makers; however, the focus is still largely on getting the infrastructure and creating the e-learning content. It is necessary to consider the individual factors that play an important role in the adoption of e-learning in Ugandan universities, a case of Muni University. For example, the attitudes and perceptions of students and lecturers towards e-learning may affect their acceptance of the technology in the teaching-learning process.

The study aimed at evaluating the level of user satisfaction, usability issues affecting e-learning adoption and established the factors hindering the Acceptance and Use of teach management Systems by Lecturers and Students in Uganda. Primary research method was cross sectional design using questionnaire survey, and data was collected from 130 students and 10 lecturers of Muni University. The respondents agreed that the functionality of the system is good; the system is reliable, portable, usable, maintainable and efficient. The users also showed a positive Attitude to use the system and also indicated that, there are no specific person available to provide assistance for the users and Lack of Equipments, Course Quality Concerns, Slow Speed of the E-system, Power problems, Accessibility problems, Network Connections Issues, Lack of Usability policy, Legal concerns and Lack of regular training on use Moodle hinder their usage of the system.

Therefore, in order to ensure that all the students and staff can fully embrace the E-Learning Management System, the system should be accessible to the users, there should be a user policy to guide users, more training should be given to both new and old users.

KEYWORDS: Evaluation, e-learning, Lecturers, Students.

I. INTRODUCTION

A good number of Universities in Uganda are adopting the use of Learning Management System (LMS) to handle its needs of learning and teaching processes. Muni University is among those Universities in Uganda which employs a Learning Management System (Moodle) as a Service for their over 200 students since 2014.

As the implementation of e-learning is increasing worldwide. As more and more institutions review their e-learning programs from the various dimensions of an e-learning environment, we become increasingly more knowledgeable about e-learning which, in turn, guides us to further inquiry in the field. Literature on e-learning program evaluation is naturally.

Reference [4] noted that few fully developed programs have arrived at a stage where summative evaluation is possible.

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Assessment of the system is conducted to improve the effectiveness and efficiency of eLearning and there are different types of evaluations, such as formative and summative. Formative ones are usually made through the development process of the project, where summative ones are conducted as the final assessment of the project, to judge the match between the expected results, the invested resources, and the goal achieved [5].

Reference [7] defines summative evaluation as how effective the program has been or whether the research project has met its original objectives. Reference [3] introduced two different situations that can be evaluated: First the evaluation of the software (IT-System as such), which means to evaluate without any involvement from users and second, evaluation of software (IT-system in use), which means to study a use situation where a user interacts with software in this case who are the students and the lecturers.

II. RELATED WORK

1.1 ISO-9126

The ISO-9126 model was developed by the International Organization for Standardization (ISO). According to Reference [2], this organization was founded in 1946 to facilitate international trade, coordination, and unification of industrial standards by providing a single set of standards that would be recognized and respected. The ISO-9126 model was developed in 1991 to provide a framework evaluating the quality of the software [1], and this model defines six characteristics and each characteristic has its sub characteristics as shown in the table 1 below and according to Reference [2], ISO-9126 model is a simple model for the non-specialists to employ, and it covers a wide range of system features.

According to ISO-9126, there are five (5) other software attributes that characterize the usefulness of the software in a given environment. The main characteristics of the ISO9126-1 quality model can be defined in terms of: Functionality, Reliability, Usability, Efficiency, Maintainability and Portability.

Table Error! No text of specified style in document.1: ISO-9126 Model

S/No	Characteristic	Characteristic Explanation	Characteristic Sub
1	Functionality	Suitability	Can software perform the tasks required?
		Accurateness	Is the result as expected?
		Interoperability	Can the system interact with another system?
		Security	Does the software prevent unauthorized access?
2	Reliability	Maturity	Have most of the faults in the software been eliminated over time?
		Fault tolerance	Is the software capable of handling errors?
		Recoverability	Can the software resume working and restore lost data after failure?
3	Usability	Understandability	Does the user comprehend how to use the system easily?
		Learnability	Can the user learn to use the system easily?
		Operability	Can the user use the system without much effort?
		Attractiveness	Does the interface look good?
4	Efficiency	Time behavior	How quickly does the system respond?
		Resource utilization	Does the system utilize resources efficiently?

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5	Maintainability	Analyzability	Can faults be easily diagnosed?
		Changeability	Can the software be easily modified?
		Stability	Can the software continue functioning if changes are made?
		Testability	Can the software be tested easily?
6	Portability	Adaptability	Can the software be moved to other environments?
		Installability	Can the software be installed easily?
		Conformance	Does the software comply with portability standards?
		Replaceability	Can the software easily replace other software?

1.2 WHY LEARNING MANAGEMENT SYSTEM EVALUATION?

Evaluating a system is a course of accomplishment for determining the value and usefulness of a learning system with benefits such as error correction, establishing the users' point of view and reducing unsupportable design issues in a system. There are four reasons for evaluating e-learning system; validating training as business tool, justifying costs incurred in training, help improve design of training, and to help in selecting training methods. In the context of this study, the evaluation of the e-learning system is to help enhance the design of the training and the design of the e-learning system.

1.3 PROBLEMS HINDERING SUCCESSFUL IMPLEMENTATION OF LMS

According to Reference [6], Implementation processes of Learning Management Systems sometimes fail in Institutions due to some of the following.

- Leadership, not only by management and academic leaders, but also by those who have political influence within the institution.
- Organization-wide buy-in and appreciation for what an LMS can and cannot do.
- Congruency with how instructors teach. Implementing an LMS can itself lead instructors to reconsider their teaching methods.
- Appreciation of the cultural changes required to achieve success. Resistance to change can arise, especially among those familiar with an existing LMS, as they know its shortcomings and have developed workarounds.
- Training for instructional designers, instructors, students, and information technology specialists.
- Quality support, including pedagogical and technical support.
- Student and instructor computer literacy skills.
- Student access to computers, the Web, and/or the LMS.
- Adequate access to the Internet for students and staff.
- User-friendliness of the software. The software must be easy to use, even for novices.
- Funds required for hardware, including servers, network infrastructure, backup storage, backup power supply, air conditioning for the hardware, and computers/digital terminals.

III. METHODOLOGY

Primary research method used was cross sectional design using questionnaire survey and the study was carried out in semester II 2015/2016 academic year and the total population of both students and lecturers was 215, which comprised of 200 students and 15 lecturers. Using Slovenes formula $n = \frac{N}{1+N.e^2}$, a sample of 140 was used.

Where

- n = sample size;
- N = Population size
- e = level of significance / error (0.05)

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The actual sample was taken from each category of students and lecturers which was calculated using the sampling fraction formula below to arrive at the minimum sample size of 10 lecturers and 130 students.

$$\text{Sampling fraction} = \frac{\text{actual sample size}}{\text{total population}}$$

Sampling fraction=140/215

Sampling fraction= 0.65

The questionnaire had 48 Questions with a four-point Likert scale of Strongly Disagree, Disagree, Agree and Strongly Agree and comprised majorly questions items on Functionality of the system, Reliability of the system, Usability of the system, Efficiency of the system, Maintainability of the system, Portability of the system, Facilitating Condition to use the system, Attitude of users to use the System and Problem hindering usage of the system.

IV. FINDINGS

The table below shows the participation by students and staff members

S/No	Category	Number	Percentage
1	Staff	10	7%
2	ISM students	74	53%
3	ITM Students	56	40%
Total		140	100%

A total of 140 respondents participated, ten (10) were Teaching staff members, 74 Bachelor of Information Systems (ISM) student and 56 Bachelor of Science of Information Technology (ITM) students. Out of the total sample of 140 respondents, 72 % were male and 28 % female.

Below are the results from the respondents

S/No	Construct	Items	Mean	Std. Deviation	coefficient of variation(VC)	Interpretation
1	Functionality	The software can perform the tasks required?	3.1	0.7	22.3	Agree
		The system results are as expected?	3.0	0.6	21.0	Agree
		The system interacts with another system?	2.5	0.8	32.3	Agree
		The software prevents unauthorized access?	3.2	0.7	22.1	Agree
		Mean	3.0	0.7	24.0	Agree
2	Reliability	Most of the faults in the software can be eliminated over time?	2.7	0.8	28.7	Agree
		The software is capable of handling errors?	2.6	0.7	27.6	Agree
		The software resumes working and restores lost data after failure?	2.3	1.7	76.1	Disagree
		Mean	2.5	1.1	42.4	Agree
3	Usability	The users comprehend how to use the system easily	2.7	0.8	29.6	Agree
		The user learns to use the system easily	2.9	0.8	27.8	Agree
		The user uses the system without much effort?	3.0	0.7	24.2	Agree
		The interface looks good?	3.0	0.8	25.7	Agree
		Mean	3.0	2.7	92.1	Agree

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4	Efficiency	The system quickly responds to queries?	2.8	0.8	27.3	Agree
		The system utilizes resources efficiently?	2.8	0.7	26.6	Agree
		Mean	2.8	0.8	26.9	Agree
5	Maintainability	The faults can easily diagnose?	2.5	0.7	29.6	Agree
		The software is easily modified?	2.6	0.9	33.7	Agree
		The software continues functioning if changes are made?	2.8	0.8	27.7	Agree
		The software can be tested easily?	2.7	0.8	31.0	Agree
		Mean	2.6	0.8	30.4	Agree
6	Portability	The software can be moved to other environments?	2.4	0.9	38.3	Disagree
		The software can be installed easily?	2.6	0.9	33.9	Agree
		The software complies with portability standards?	2.7	0.9	33.0	Agree
		The software can easily replace other software?	2.6	0.8	30.5	Agree
		Mean	2.6	0.9	33.8	Agree
7	Facilitating Condition	I have the recourses necessary to use E-Learning System	3.0	0.9	28.8	Agree
		I have the knowledge necessary to use E-Learning System	2.9	0.9	29.7	Agree
		E-learning Is not compatible with other systems i use	2.2	1.0	43.3	Disagree
		A specific person is available for the assistance	2.4	0.9	38.5	Disagree
		Mean	2.6	0.9	34.3	Agree
8	Attitude to use the system	E-learning system is a good idea	3.5	0.7	20.7	Strongly Agree
		E-learning system makes study more interesting	3.4	0.7	20.8	Strongly Agree
		Studying with E-learning System is fun	3.0	0.9	30.1	Agree
		I like studying with E-learning system	3.4	0.7	21.7	Strongly Agree
		Mean	3.3	0.8	23.1	Strongly Agree
9	Problem Hindering Usage	Lack of Equipments	2.6	1.0	40.3	Agree
		Course Quality Concerns	2.8	0.8	30.1	Agree
		Slow Speed of the E-system	2.5	0.9	36.6	Agree
		Power problems	2.9	1.0	33.4	Agree
		Accessibility problems	2.7	1.0	37.9	Agree
		Network Connections Issues	2.9	1.0	34.1	Agree

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	Lack of Usability policy	2.5	1.0	38.6	Agree
	Lack of regular training on use of new Moodle	2.7	1.1	39.5	Agree
	Legal concerns	2.6	2.7	102.4	Agree
	Lack of Skills	2.2	0.9	43.1	Disagree
	Slow speed of the computer	2.5	0.9	36.5	Disagree
	Lack of interest	2.0	0.9	45.3	Disagree
	Complicated to use	2.1	0.9	44.5	Disagree
	Not aware of its availability	1.9	1.0	53.3	Disagree
	University traditional culture	2.3	1.0	42.6	Disagree
	Lack of Motivation	2.5	0.9	37.6	Disagree
	Course not suited for E-learning	1.9	1.0	51.2	Disagree
	Long enrollment process	2.4	1.1	46.3	Disagree
	Mean	2.4	1.1	43.6	Disagree

Functionality: Functionality is the essential purpose of any product or service, it was agreed by the respondents that the system functionality is okay with a mean of 3.0. This means that it was statistically significant to say that Muni University has good working Learning Management System.

Reliability: Once a software system is functioning, as specified, and delivered the reliability characteristic defines the capability of the system to maintain its service provision under defined conditions for defined periods of time. The respondents on average agreed that the system is reliable with mean of 2.5 but disagreed that the software resumes working and restores lost data after failure. This means that it was statistically significant to say that Muni University needs to work on the Learning Management System so that students and lecturers can fully rely on it.

Usability: Usability only exists with regard to functionality and refers to the ease of use for a given function, the respondents on average agreed that the system is good with mean of 3.0. This means that it was statistically significant to say that the Learning Management System is very important to both the students and lecturers of Muni University.

Efficiency: This characteristic is concerned with the system resources used when providing the required functionality: with this construct, users agreed on average that the system is efficient with a mean of 2.8. This means that it was statistically significant to say that Muni University needs to work on the Learning Management System so that it can function efficiently.

Maintainability: The ability to identify and fix a fault within a software component is what the maintainability characteristic addresses. The respondents agreed that the system can be maintained with a mean of 2.6. This means that it was statistically significant to say that the Learning Management System is maintained when it develops problems therefore making it usable to both the students and lecturers of Muni University.

Portability: This characteristic refers to how well the software can adopt to changes in its environment or with its requirements, here the users agreed that the system can adopt to the changes with a mean of 2.6 but in terms of Adaptability disagreed that the software can be moved to other environments with a mean of 2.4. This means that it was statistically significant to say that the Learning Management System can be easily moved to any computer environment but for it to adopt to the environment it takes time therefore making it difficult for the users to use.

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Attitude to use the system: For a system to succeed the attitude of the users is supposed to be positive, here the results showed that the respondents strongly agreed on average that they have positive attitude in using the system with a mean of 3.3. This means that it was statistically significant to say that the Learning Management System is highly appreciated by both the students and lecturers of Muni University thus making their learning easy.

Facilitating Condition: Facilitating conditions for the users to use the system are very important even if you have a positive attitude, the respondents agreed on average 2.6 that they have facilitating conditions to effectively use the system but they disagreed that a specific person is always available for the assistance with a mean of 2.4.

Problem Hindering Usage: In every environment, there are some problems which can hinder the usage of the system in an institution, hence in Muni University, the results showed that the respondents disagreed on average that there are problems hindering the usage of the system with a mean of 2.4. although they agreed that Lack of Equipments (mean=2.6), Course Quality Concerns (mean=2.8), Slow Speed of the system (mean=2.5), Power problems (mean=2.9), Accessibility problems (mean=2.7), Network Connections Issues (mean=2.9), Lack of Usability policy (2.5), Legal concerns (mean=2.6) and Lack of regular training on use of new Moodle hinder their usage of the system (2.7). This means that it was statistically significant to say that the Learning Management System still has many challenges which need to be fulfilled in order for the students and lecturers to fully use it.

V. CONCLUSION

The studies aimed at evaluating the level of user satisfaction, usability issues affecting e-learning adoption and the respondents agreed that the functionality of the system is good; the system is reliable, portable, usable, maintainable and efficient. The users also showed a positive Attitude to use the system and also indicated that there are Facilitating Conditions but not having specific person available for the assistance.

In terms of the factors hindering the Acceptance and Use of learning management Systems by Lecturers and Students in Uganda the following were cited among the top hindrance; Lack of Equipments, Course Quality Concerns, Slow Speed of the E-system, Power problems, Accessibility problems, Network Connections Issues, Lack of Usability policy, Legal concerns and Lack of regular training on use Moodle hinder their usage of the system.

The institution should continuously carry out evaluation of the system for its continuity and make use of the positive attitude of students to use the system and the good facilitating conditions for the success of the system. The institution should also try to address the factors hindering the usage of the learning system.

VI. RECOMMENDATIONS

From research findings and the discussion on emerging factors resulting from the evidence of gathered data, following recommendations can be made for future actions in Evaluation of E-Learning Management Systems by lecturers and students:

- Adequate computer Equipments should be purchased by the university so that the system can run without problems.
- Regular training on the use Moodle should be given to students and lecturers.
- The E-Learning Management Systems should be made available on the internet so that students can study wherever they are.
- Usability policy should be established by the university so that entire university staff and students can use the system without any problem.

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