

Learning Management System (LMS) in Higher Education Institutions

Mohamed Fathima Rashida

Department of Management and Information Technology
South Eastern University of Sri Lanka, Sri Lanka
rashida@seu.ac.lk

Abstract. E-learning is an important role in this knowledge era. Learning Management System (LMS) is a tool which is used as a platform to implement e-learning process. It provides an efficient and effective ways to store, manage, share its academic resources and knowledge and supplement their traditional way of teaching. The implementation of LMS has become a requirement at universities as it is enhancing the teaching and learning environment. The students' viewpoints, lecturers' performance, characteristics of LMS and support of university that play a significant role in determining e-learning implementation. In conclusion, universities should use LMS by improving learners' viewpoints, must confirm that the lecturers are using the LMS in their teaching and learning activities and they are capable to use it, must point out the importance of LMS on learning environment and provide good service for effective LMS implementation in university learning environment.

Keywords: E-Learning, Blended Learning, Learning Management System

1. Introduction

The use of Information and Communication Technology (ICT) could be an energetic requirement for the expansion of a knowledge-based economy, to increase human resources specifically for third world countries. Thanks to the larger use of information and communications technologies, higher education institutions are continuing typical modifications. The results of this typical modifications within the use and implementation of e-learning, that has arisen as an overbearing tool to share knowledge with the academics as well as commercial sectors

As Managing Intellectual Capital via E-Learning at Cisco, E-learning is the process of using Web-based communication, collaboration, learning, information transfer, and training so as to acquire by learners and businesses. E-learning is controlled to become an important module of data propagation, and develops as the new standard of recent education system meantime it's benefits such as increased efficiency and cost saving, transparency, measurability, flexibility, accessibility consistency and upgraded student performance. As per to [1], all strategies of web-based learning still succeed across all phases of university education and are increasing constantly.

Some higher education institutions are consuming e-learning systems to support for their traditional ways of teaching (blended learning), meanwhile others consume it as a supportive tool for distance learning (pure exclusive e-learning). So as to [2], blended learning environment is a combined instructional way of direct or face-to-face manner with the support of online learning, either synchronously or asynchronously. And again in 2010, [3] outlined blended learning as a mixture of online-learning and usual classroom face-to-

face learning environments. As oppose to blended learning environment, in distance learning, e-learning are often used to maintain a pure virtual learning system with all course works are done completely in an online manner.

Furthermore, the improvement of e-learning systems is fairly a challenge for government and government universities and industry. According to EIT artousis, education success doesn't swear solely on technology, however it relies on careful strategy implementation and planning for the implementation should be closely inspected and the implementation between users is very important concern. As per to [4], both IS professionals and researchers bear plentiful difficulties in theoretical and methodological concepts. Most of the initiative higher education institutions of e-learning in third world countries haven't been successful [5][6][7]. Most of those higher education institutions only know that why several first movers of the system stop their eLearning system when their initial involvement [8]. As a significance of these problems, the theory formulation and principles associate with e-learning triumph to guide to attain an efficient system is become as a condition. additionally, as per to request to evaluate the IS increase by means of e-learning application, similarly the need for the investment on e-learning increase. however, before investment in on an e-learning system, there's an essential requirement to assess the success of the systems.

2. Background of the Study

According to the increasing convention of the Internet, many scholars have inspired to develop web technologies and web-based applications. The character of e-learning and information technologies in educational institutions endures to increase in scope and concentration. each public higher education institutions got the opportunity to create the use of Internet as a backbone communication medium with the learners thanks to the rapid development of ICT infrastructures. to substantiate that the university education programs delivered via technology are in an acceptable manner, it's important and the best way to assess the e-learning systems followed by them. In case of Sri Lankan, the Sri Lankan government also found the important of latest technologies as a tool to do changes and modernization in education system. Because of that, by introducing the Higher Education for Twenty first Century (HETC) project, the government provide highest significance for practical and technology base education system in universities. Consequently, it has allocated lump sum on money to acquire and improve technology infrastructures at university and school level too in Sri Lanka. Therefore, in terms of research study, subsequently the e-learning system is growing effectively, it's become as one of the foremost practically and in theoretically vital.

2.1. The LMS Implementation on Teaching and Learning

As contrast to traditional learning method, 24*7 availability at any place for education in e-learning system is the advantage of e-learning. This kind of educational method provide new ways for implementing educational inventions for students for their active participation, independent, self-reflected and collaborative participation in learning environment. Furthermore, it provides easy way for teachers for managing online courses such like course content development, add, update, customize, and reuse those learning objects for future needs.

As [9], e-learning system is the powerful software system development and is the important of the innovation of web-based technology, to develop education in different environments. Meanwhile, [10] summarized the cost-effectiveness, consistency, timely content, flexible accessibility and customer value are the other paybacks of e-learning. Moreover, students got a gateway for network with others, control their own learning, development of critical thinking skills, and a sense of community with other learners by using e-learning. According to [9], even though e-learning has several paybacks, high cost for the introduction of e-learning system, anticipating new skills from contend producers and anticipating high responsibility and self-discipline from learners are some drawbacks of it. Most of the implementation process for e-learning is still step forward without proper knowledge of how learning theories can be adopted to the educational requirement [11]. Therefore, the students might be hesitated to change to e-learning. Similarly, institutions also can improve the threats associated with e-learning introduction by using it with traditional classroom teaching as an additional tool, or in other words, forming a blended learning environment. According to the statement of [3], bended learning is the recent fashion in higher education, and students also actively participating on it to collaborative learning and interaction with teachers and classmates. Furthermore, e-learning create a platform for deliver the lecture materials and track the students' movement.

2.2. Determinants of LMS Implementation

Each and every person is theme to his or her personal trusts and to the surroundings he committed with. Technology Acceptance Model addresses that observed effectiveness and perceived comfort of use encouragement the users' intent to use information technology whichever directly or intervening via attitude towards the behavior, lead to real usage of the system. DOI composed that further individual beliefs of the innovation characteristics, additional factors such as characteristics of individual, organizations and external characteristics are also dominant in modeling once behavior connected with individual implementation behavior.

Numerous authors have recognized determinant factors for e-learning implementation and utilization. According to [12], has concluded that e-learning determinant factors were summarized on students' point of view as instructor characteristics, student characteristics, technology infrastructure and university support. And according to [13], he has tested 512 learners' opinion on determinant factors are lead to the LMS implementation are: learner characteristics, instructor characteristics, LMS characteristics, classmates' characteristics, course characteristics, and organization characteristics.

There are several studies which have examined the success of information technology in point of education from the learners' viewpoint. Some of are [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29] and [30]. However, all of these studies were not related the scope of implementation of LMS tools with their consistent determinants using quantitative approach. More than this, some studies such as [16], [31], [32] have been written on LMS for developed counties. Similarly, very few is available of factors that determining Sri Lankan implementation patterns of LMS from students' viewpoints. In contradiction of this background, it is important to measure the determining factors for effective implementation of LMS in teaching and learning from students' viewpoints.

2.3 Concept of the Study

There is a common belief that e-learning environments is having several learning benefits and can its upgrading students' and educators' skills. The implementation of an e-learning platform such as Blackboard, WebCT, Moodle or Sakai, Angel, Desire2Learn etc., is the most familiar tactic to the implementation of e-learning at universities. This tactic is called as Content or Course Management Systems (CMS) or Virtual Learning Environments [28]. E-learning is an integrated platform or Web-based technology. Which is used to plan, implement, and assess a specific learning activity. In spirit e-learning is a collection of software tools, which is usually organized around a class or unit of instruction. The collection contains several tools, among that most of the tools needed by the faculty members to teach a class. These are software to arrange and lecture content, interconnect, evaluate the students' performance, record and report rankings, and manage lecture material and activities. The integration of a collection of teaching technologies into a strong set of technological tools is a key goal of learning management software, which make it cool for lecturers to use technology in teaching. E-learning have become conceivably the most commonly used educational technologies within universities, after only the common office software and Internet [28]. Some researchers also recommended that higher education has never seen any modernization result in such speedy and common use as the e-learning [33].

E-learning propose changing opportunities and evolving new innovative ideas in education as same as assisting adjustability for organizations. E-learning use has become a prerequisite at government universities. Sri Lankan government universities has established their own e-learning portal for the use of their own students. E-learning portal has tools with it for students' communication and collaboration among the class mates and lecturers as well.

E-learning platform is providing some specific features for lecturers which are very useful for them to issue the learning materials, interactivity structures such as thread chats, sharing files and forums. And it also providing some features which are supporting for management activities such as distribution and following, inspection, preparation, virtual live classes and several statistical analyses. This one is taking very less time and effort the same teaching process.

In spite of this probability to increase learning by the way of consuming an e-learning platform for the distribution of e-learning, frequently underutilized structures and functionalities that have been constructed into this system [34]. Consumption of e-learning facilities rate of the Students' is still very low [20]. Basically e-learning platform is used to communicate information to learner. Rather than encouraging the application among the students' the actual risk or key challenges are support and enable effective implementation that is likely to have significant influence on student learning side. So, universities have the responsibility to find out the factors that influence the students' and instructors' implementation of online learning environment.

This study is closely looking at the e-learning tools, determinants of e-learning implementation, assessing the results and providing set of commendations with the effort to improve the e-learning implementation into T&L activities in order to confirm the achievement and appreciate the benefits of e-learning.

3. Background of LMS

E-learning can be defined as an online method used for education purpose to share information and collaborate electronically [17]. E-learning system is referred as a special software

application which is specially process with the help of internet as a medium to backing education and the learning activities [35][36].

From the time when late 1990s, in higher education sector, the consumption of e-learning platform for web-based teaching has gradually increased. E-Learning is used for distant learners by delivering electronic learning materials and it was consider as a new vehicle that would prime education to new learning methods [34].

3.1. E-learning Implementation

The e-learning is a combination of different information technology tools used by the government universities to boost their online involvement. It can be used as a main communication media to conduct online courses or it can be used to improve traditional courses. It is developed with course management software and some other collaborative applications. Information Technology used to support, maintains, and develops these software as platforms. For the effective implementation of this e-learning initiatives, instructional support and training is need to be provided.

3.2. LMS Implementation

The LMS is a combination of different information technology tools used by the government universities to boost their online involvement. It can be used as a main communication media to conduct online courses or it can be used to improve traditional courses. It is developed with course management software and some other collaborative applications. Information Technology used to support, maintains, and develops these software as platforms. For the effective implementation of this LMS, instructional support and training is need to be provided.

3.2.1. Prior Studies on LMS Implementation

In 2012,[13] used 512 students to examine the LMS implementation related learners' viewpoint on determinant factors are summarized as: characteristics of learner (computer anxiety, technology experience, self-efficacy, and personal innovativeness), characteristics of instructor (approach, teaching style, control, and responsiveness), characteristics of LMS (system quality, information quality, and service quality), characteristics of classmates (approach and interaction), characteristics of the course (quality and flexibility), and characteristics of the organization (management support and training).

And in 2012, [37] studied determinant factors that affect the use of LMS in Saudi Arabian higher education: Their study revealed clear understanding regarding the internal and external variables or determinant factors that impact the use of LMS in teaching and learning environment. The internal variables contain of the approach of faculty members on using LMS, their e-learning beliefs, and their proficiency level in using LMS. The external variables contain barriers faced by the faculty members and demographic factors in implementing LMS. Furthermore, three demographic factors are established as determinant factors that may impact the LMS utilization, which are gender, experience in using computer as well as training and attending workshops. The theoretical framework for studying the determinant factors influencing the LMS utilization is develop from the Reasoned Action Theory produced by [38] and Technology Acceptance Model.

In 2011, [15] examined the suitability of 52 items in order to measure the success of Blackboard course management system with for confirming the Blackboard CMS success scale in an educational background. The survey was conducted among 503 students of the University of Botswana to ensure the Blackboard course management system success scale. Hypothetically, his survey contributes considerably to identify the educational oriented factors such as teaching and learning quality, students' self-regulated learning and that may support to Blackboard CMS by revising the factors initiated and revised by [39]. As the conclusion, the study revealed that content quality, system quality, support service quality, teaching and learning quality, self-regulated learning, intention to use, user satisfaction, and net benefits are important scopes for evaluating the success Blackboard CMS. If any one of the tertiary education institution implementing e-learning finds itself without concerning any of these scopes or factors, then it may do a more detailed analysis and take necessary corrective actions.

In 2011, [19] examined the factors influencing perceived usefulness of wikis for group collaborative learning by first year students. On this study he found that usefulness of wiki was influenced by the prior expertise with wikis among students, with their apparent convenience with wikis being strongly influenced by their instructors' approach focusing the technology, and the ease of access to the wikis. The complete approach of students' focus wikis was basically influenced by the how much they depend on wikis as a helping tool with their assignment work, and their purpose to use wikis in the future was driven by their awareness of wiki's usefulness.

In 2010, [20] studied the influencing factors on students' use of an e-learning Portal from students' viewpoints. 215 science students from five different classes were enrolled in a basic Calculus course. Their survey found out the influencing factors on students who experiencing e-learning in teaching and learning at the University. They observed five factors which are the students' technology competencies, the role of lecturers, access to e-learning and approach towards the usage of e-learning. Outcomes exposed that the highest mean denotes to students' technology competencies, then the design of e-learning platform, approach toward the usage of e-learning platform, the role of lecturers and at last access to the portal.

In 2009, [4] piloted a study, on which he attained substantial improvement to emerging a common mechanism Hexagonal E-Learning Assessment Model (HELM) for evaluating the satisfaction attained by the student with e-learning systems. 6 different categories that determining the factors that influencing e-Learners' satisfaction by using this proposed HELM model which are Technical Issues: System Quality, Technical Issues: Service Quality, Technical Issues: Content Quality, Social Issues: Learner Perspective, Social Issues: Instructor Approach, and Supporting Issues. There are 45 determinant factors under these 6 different categories to evaluate e-learning efficiency. These 45 determinant factors are quantified by survey question. By aggregating the sum of all of these 45 determinant factors, the complete success of e-learning can be assessed.

In 2009, [22] surveyed the influence of learner characteristics and LMS characteristics on LMS use. On this survey he put forward a complete observation on the determinant factors that impact the learners' recognition of LMS and thus their use of it. All these determinant factors are associated to the major elements of e-learning: the learner, the instructor, the course, the classmates, the organization, and the technology.

In 2008, [24] studied how the learners' characteristics influencing on learners' perceived ease of use and perceived usefulness of Virtual Learning Environment (VLE). The information for this survey was collected from 45 Chinese participants on an Executive MBA program. The outcome of this survey specify that perceived usefulness has a direct effect on VLE use. Personal norms and perceived ease of use have indirect effect on perceived usefulness. Personal innovativeness and computer anxiety have only direct impact on

perceived ease of use. The program managers who are the implications in education should not only worry themselves with simple system design but also obviously state individual differences between VLE users.

In 2000, [29] studies the impact of instructor characteristics on learners' satisfaction with LMS. The survey studied technological and pedagogical effect and student characteristics on Internet based MBA courses learning. Among these characteristics, he has concluded that instructors' efforts to create a collaborative classroom environment were considerably related with student learning. Other characteristics were not considerably connected with student learning. These outcomes propose that teaching expertise may be the principal standard and for some extend, technological sophistication may be essential, for teaching success in the online classroom environment. Consequently, instructors may need to devote more time on evolving and promoting instructional skills such as developing interesting discussion questions, simultaneously working with several smaller groups of students, and fostering intimacy. To support for this deployment, universities need to make significant ground level investments to make sure that the course offering in online are educationally and technologically beneficial for students' learning. For any information system, the success of the e-learning implementation can be evaluated in terms of usage, acceptance, user and satisfaction. Evaluating the user acceptance and satisfactions are the prime marketing components for managing e-learning initiatives [10].

4. Conclusion

This attempt to provide a discussion relevant to LMS implementation higher education institutions. According the studies, students' viewpoints, lecturers' performance, characteristics of e-learning tool, and organizational characteristics were the determinants to e-learning implementation. Results of this study have given into the body of knowledge from theoretical and practical perspective. From theoretical side, it has provided experiential framework separately from confirming infamous theories and models such as TAM, DOI, ISSM, and ESM. From practical side, the tool can be used to measure students' viewpoints, lecturers' performance, characteristics of e-learning tool, and organizational characteristics in an e-learning implementing higher educational environment. This study could be more extent to find the key factors of successful e-learning concept in higher education institutions.

References:

- [1] M. Fathi. and L. Wilson Strategic Planning in Colleges and Universities. *The Business Renaissance Quarterly* (4)1, pp. 91–103. 2009.
- [2] M.LGribbins, et al. Technology-Enhanced Learning in Blended Learning Environments: A Report on Standard Practices. *Communications of the Association for Information Systems*, 20(46), pp. 741–759. 2007.
- [3] W. C Wu, L. Y Hwang. The Effectiveness of e-Learning for Blended Courses in Colleges. *International Journal of Electronic Business Management*, Vol. 8, No. 4, pp.312-322. 2010.
- [4] S. Ozkan., R. Koseler., N. Baykal. Evaluating Learning Management System: Hexagonal e-learning Assessment Model. *Transforming Government: People, Process and Policy*, 3(2): pp. 111-130, Emerald Group Publishing Limited. 2009.
- [5] P. C Borstorff. and L. S. Keith, Student perceptions and opinions towards e-Learning in the college environment. *Academy of Educational Leadership Journal*, 11(2). 2007.

- [6] M. Saeedikiya. A. Mooghali., and B. Setoodeh. Stages of the Implementation of E-Learning in Traditional Universities. *Edulearn10 Proceedings*, Pp. 6620-6624. <http://library.iated.org/view/saeedikiya2010sta>. 2010.
- [7] S. Sife, E.T. Lwoga and C. Sanga,), New technologies for teaching and learning: Challenges for higher learning institutions in developing countries, International Journal of Education and Development using Information and Communication Technology (IJEDICT), 3(2), pp. 57-67. Available at <http://ijedict.dec.uwi.edu/viewarticle.php?id=246&layout=html> (24/02/2016). 2007.
- [8] P Sun.,, et al. What Drives a Successful E-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction. *Computers & Education* (50)4, pp. 1183–1202. 2008.
- [9] V Cantoni.,, M. Cellario, and M. Porta. Perspectives and Challenges in E-Learning: Towards Natural Interaction Paradigms. *Journal of Visual Languages and Computing* (15)5, pp. 333–345. 2004.
- [10] T. Kelly., and D. Bauer Managing Intellectual Capital via E-Learning at Cisco. in Holsapple, C. (ed.) *Handbook on Knowledge Management 2: Knowledge Directions*, Berlin, Germany: Springer, pp. 511–532. 2004.
- [11] M. Kakasevski.,, A.. Sime and C. Slavcho. Evaluating Usability in Learning Management System Moodle. Proceedings of the ITI 2008 30th International conference on IT interfaces, June 23- 26. 2008.
- [12] H. M. Selim Critical Success Factors for e-learning acceptance: confirmatory factor models. *Computers & Education* 49, 369-413. 2007.
- [13] K.A. Al-Busaidi, Learners' Perspective on Critical Factors to LMS Success in Blended Learning: An Empirical Investigation. *Communications of the Association for Information Systems*, 30(2) . 2012
- [14] Goldipuri. Critical success factors in e-learning. *International Journal of Multidisciplinary Research* 2(1), ISSN 2231 5780. 2012.
- [15] Adeyinka Tella. Reliability Factor Analysis of Blackboard Course Management System Success: A Scale Development and Validation in an Educational Context. *Journal of Information Technology Education*; 10. 2011.
- [16] L.Chih-Cheng.,, M .Zheng.,, and L. Robin Chiu-Pin., Re-examining the Critical Success Factors of e-learning from the EU perspective. *International Journal of Management in Education* 5(1):44-62. Available at: <http://www.ingentaconnect.com/content/ind/ijmie/2011/00000005/00000001/art00003>. 2011.
- [17] S. Lonn, and S.D. Teasley, Podcasting in higher education: What are the implications for teaching and learning? *Internet and Higher Education*, Volume 12 pp. 88–92 .2009
- [18] A.Riaz,, M.Hussain,. Students' Acceptance and Commitment to E-Learning. *Journal of Educational and Social Research*, 1 (5). 2011.
- [19] Zixiu Guo and K.J Stevens,. Factors influencing perceived usefulness of wikis for group collaborative learning by first year students. *Australasian Journal of Educational Technology* 27(2), 221-242. 2011.
- [20] A. F. M Ayub,, R. A Tarmizi, W. M. W Jaafar.,, W. Z. W Ali., and W. S Luan,. Factors influencing students' use of a LMS portal: Perspective from Higher education students. *International Journal of Education and Information Technology*. 4(2). 2010.
- [21] M.D Lee, Three case studies in the Bayesian analysis of cognitive models. *Psychonomic Bulletin & Review*, 15(01), pp. 1-15. 2008.
- [22] K.A. Al-Busaidi, The Impact of Learning Management System Characteristics and User Characteristics on the Acceptance of E-Learning. *International Journal of Global Management Studies*, 1(2), pp. 75–91. 2009.
- [23] S.-S Liaw,. Investigating Students' Perceived Satisfaction, Behavioral Intention, and Effectiveness of ELearning: A Case Study of the Blackboard System. *Computers & Education* (51)2, pp. 864–873. 2008.
- [24] E Raaij., and J. Schepers The Acceptance and Use of a Virtual Learning Environment in China. *Computers & Education* (50)3, pp. 838–852. 2008.
- [25] S. S Liaw,, H.M Huang.,, and G.D Chen. Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49(4):1066-1080. 2007.

- [26] Z. Wan, , Y. Fang, and H. Neufeld. The Role of Information Technology in Technology-Mediated Learning: A Review of the Past for the Future. *Journal of Information Systems Education* 18(2), pp. 183–192. West et al.. 2006.
- [27] K. Pituch, and Y. Lee The Influence of System Characteristics on E-Learning Use. *Computers & Education*, 47(2), pp. 222–244. 2006.
- [28] G.P.C Genove,, and C.A. Mercado, Gap Analysis of LMS Profile Requirements Using Standards. 2015.
- [29] J.B. Arbaugh, Virtual Classroom Characteristics and Student Satisfaction with Internet-Based MBA Courses. *Journal of Management Education*, (24)1, pp. 32–54. 2000.
- [30] T. Volery, and D. Lord,. Critical success factors in online education. *The International Journal of Educational Management*, 14(5):216–223. 2000.
- [31] M. Ludivine, , D. R Martinez, O Revilla, and M Jose.. Usability in e-Learning Platforms: heuristics comparison between, Sakai and dotLRN. 2009.
- [32] M. Minovic,, V. Stavljjanin,, M. Milovanovic,, and D. Starcevic, Usability Issues of e-Learning Systems: Case-Study for Moodle Learning Management System". 2008.
- [33] C. F Harrington,, S. A Gordon,, and T.J Schibik. Course Management System Utilization and Implications for Practice: A National Survey of Department Chairpersons. *Online Journal of Distance Learning Administration* 7(4) . 2004.
- [34] Y. Vovides , S.S Alonso., V. Mitropoulou,, G Nickmans,. The use of e-learning course management systems to support learning strategies and to improve self-regulated learning. *Educational Research Review* 2 (2007) 64–74. 2007.
- [35] N .Cavus,, and A. M .Momani,. () Computer Aided Evaluation of Learning Management Systems. *Procedia Social and Behavioral Sciences*, 1, 426-430. 2009.
- [36] Samsudeen, S. N., Thowfeek, M.H., & Fathima Rashida, M. (2015). School Teachers' Intention to Use E-Learning Systems in Sri Lanka: A Modified TAM Approach. *Information Knowledge and Management*, 54-59.
- [37] M.J Sherbib Asiri, , Rosnaini bt Mahmud, K. Abu Bakar, and F.A Mohd Ayub Factors Influencing the Use of Learning Management System in Saudi Arabian Higher Education: A Theoretical Framework. *Higher Education Studies* 2(2) pp.125-137. 2012.
- [38] F. D Davis,. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13, 319–340 .1989.
- [39] W.H. DeLone,, and E.R.McLean,. The Delone and Mclean model of information systems success: a ten-year update. *Journal of Management Information System*, 19(04). 2003.