

Measuring User Satisfaction in an Integrated E-Learning Environment

Mohammad Maqusi
Honors College
Texas Tech University

Abdullah Al-Salamah
Arab Open University
Kingdom of Saudi Arabia

Taleb Sarie
Arab Open University
Jordan

Abstract

E-Learning is a dynamically-evolving process that thrives on enhanced advances in IT-based systems of relevance. In turn, it becomes important for higher education institutions to employ such systems in an integrated manner. The need is perhaps even more so for institutions adopting blended learning as a mode of delivery of the learning process. In this paper, we describe the main components of need to mount an efficiently functional Learning Management System which constitutes the backbone of an E-Learning system. We also propose performance indicators for measuring the efficiency of such a system. The case is then illustrated via application to institutional practice at the Arab Open University-Kingdom of Saudi Arabia (AOU-KSA) as the Branch is the largest AOU institutional Branch.

Introduction

In developing a functional Learning Management System (LMS), it is inherently important to keep the interests of three particular groups of users in mind: students, faculty, and the institution's management/administration. In a university environment, the LMS is obviously intended to serve academic as well as administrative goals and objectives.

E-Learning, on the other hand, is a catch-all term that covers a wide range of IT and technology-based resources, especially electronic ones that are inherently intended to support and/or enhance learning. These may include CD-ROMs, DVDs, multimedia facilities, a local area network (LAN) as an Intranet service carrier, or the Internet itself. E-Learning is presumed to provide a learning process that is free from time and place constraints.

LMS is the infrastructure on which e-learning can be built and delivered [1]. It is all about integrating teaching and learning. In general, specific functions desired in an LMS include: course development, content management, course/curriculum management, course delivery, assessment skills, communication (individual and group), tracking /reporting, tutor support; etc.

Establishing a Learning Management System

In designing an efficient LMS, it is usually useful to recall the desired typical features [2] of an LMS that enable it to accomplish a number of tasks, including:

- Course management; list of courses, registration, credit info and syllabus, prerequisites
- Teaching material; courseware
- Self-assessment quizzes
- Lessons tools
- Asynchronous communication: email, forums
- Synchronous communication: chat, whiteboard, teleconferencing
- Student tools: Home page, self tests, bookmarks, etc.
- Student management tools: progress tracking, online homework submission, etc.

A Learning Management System (LMS) refers, in essence, to a suite of functionalities designed to deliver, track, report on and manage learning content, learner progress and learner interactions.

Fortunately, many open source software application packages are available to support the implementation of LMS. They include Moodle, A Tutor, etc. At the AOU, Moodle was chosen as the platform upon which the erection of the LMS stands, mainly due to the fact that it is an efficient open source. This latter platform permits the use of Web 2.0 rather easily. Web 2.0, it should be mentioned, is applications-oriented, in contrast to Web 1.0 which is rather static. Subsequently, the AOU LMS was designed using the Moodle platform. It is currently in operation at the AOU-KSA. All the functionalities of the system described herein are also operational as parts of the integrated LMS. They are thus referred to in our evaluation of the system by the different constituents of users.

When embarking on the design of the LMS, one of the begging questions is whether it is more economical and more efficient to design each sub-system as a stand-alone system. At the Arab Open University-Kingdom of Saudi Arabia (AOU-KSA), it was decided that the design of an integrated system would be more practical for user access.

The main goals of the LMS should be to make more efficient and more effective the delivery of the learning process, the management of institutional operations, the offering of student services, and the linkage to external communities of interest.

The AOU-KSA Learning Management System

The Learning Management System (LMS) employed at the Arab Open University-Kingdom of Saudi Arabia (AOU-KSA) is an integrated platform of four main sub-systems. It is therefore collectively called an Integrated LMS (ILMS).

The AOU e-Learning Platform is meant to serve core user segments including the students, the academic staff, as well as the other types of users who are considered stakeholders in the mission of the institution such as parents, quality assurance staff, teaching staff, accreditation bodies as well as other types of external users.

The e-Learning Platform consists of four main systems. These are the Student Information System (SIS), Learning Management System (LMS), Content Management System (CMS), and the Student Support System (SSS). All are based on open source technologies. They are designed utilizing the Moodle platform.

Student Information System (SIS)

The first system in the e-Learning ILMS platform is a necessary tool that facilitates student admission, profiling, curriculum management, enrollment and billing, posting grades and procuring transcripts, notification services, course packages inventory as well as many other services.

Base LMS

The second system in the e-Learning Platform, the LMS, will include a wide spectrum of services ranging from learning community management to courses and learning content creation, management of learning activities (exams, workshops, lessons, exercises, etc.), and computer-mediated communication (chat, dialogue, forums, short messages, etc.).

Base CMS

The third system in the e-Learning Platform is a full-featured CMS to be used for managing various contents and particularly the university website, bulletin boards, online newsletters, electronic content repositories, and so on. The system allows advertising management, content display scheduling and syndication, search engine as well as other services including polls, voting, rating, user profiles, forums, media galleries, document managers, and events calendar.

Student Support System (SSS)

The SSS is a customer relation management system based on the well-known SugarCRM. The system is used mainly to track student inquiries. Via this facility, students also can lodge complaints or make suggestions for improving institutional operational aspects.

Copy Catch for combating plagiarism

With the expanding resources of the Internet and technology, in general, plagiarism has become a serious issue for all types of academic institutions, traditional, open, or distance. Plagiarism is a very serious issue when it occurs. In order to combat this issue, the AOU-KSA has recently taken certain concrete steps in this regard that are aimed at combating the issue of plagiarism. An innovative Student Honor Code, together with prescribed sanctions for a misconduct of committing plagiarism has been adopted as part of the academic rules and regulations of operation. Sanctions range from an assignment of a grade of zero for the concerned Tutor Marked Assignment (TMA) to as far as assigning a failing grade in the course; the latter action may come as a consequence of multiple occurrences of such misconduct. In addition, the institution has introduced a proprietary software package, called ‘Copy Catch’ which is designed to help tutors detect such unfortunate acts of dishonesty. It is hoped that these actions combined will serve as

deterrents that bring the problem under control. This latter software package operates as an integral part of the LMS.

Establishing System Evaluation Measures

In designing a set of criteria for the evaluation of LMS performance, it is important to reiterate system use as a main tool of support for the delivery of the learning process, especially in an e-learning environment. Depending on the breadth of design of the LMS, it may even be viewed as synonymous with the E-Learning platform itself. In turn, we review certain measures that are used in the evaluation of E-Learning systems in general and other measures directed at LMS in particular. We then propose a set of criteria that is suitable for application in a blended e-learning environment such as the one prevailing at the Arab Open University (AOU).

It is perhaps instructive to point out that E-Learning was originally conceptualized for employment in the realm of training of human resources in the business environment. However, the concept made its way slowly into the platforms of learning processes as part of higher education. In general, these systems are typically dynamically changing systems, partly due to internal changes in rules and regulations of institutional operation, and partly due to changes in the technology, including the software technology.

When applying E-Learning for training, the traditional method of evaluation of system effectiveness has been based on the concept of returns on investment (ROI) [3] since E-Learning was, in its early stages, limited to training rather than employment in higher education. This method depends essentially on identifying data collection instruments, and subsequently invokes five levels of investigation that deal with the probing of trainee's reaction to the program of training, what they have learnt, whether the learning has caused a shift in behavior, and whether the results have cast themselves into positive effects on the company. The fifth level of investigation is the most serious as it deals with return on investment in the sense of accrued financial benefits to the company as a result of the training program. In an educational environment, one obviously has to recast these methodologies in lines of investigation that are applicable to and meaningful in this latter environment. In our search for meaningful LMS evaluation criteria, we deliberated over this method, and concluded that its utilization would be of limited benefit in an academic environment.

Instead, we opted for measuring the user satisfaction in order to gain insight into the effectiveness of the employed LMS.

Measuring User Satisfaction at the AOU

A. Evaluation criteria for LMS

In invoking a meaningful set of criteria for evaluating and measuring user satisfaction, it seems that the following indicators provide helpful measures for said purpose [1].

1. Instructional competence; system should be built on a strong pedagogical foundation
2. Ease of access and use; system should user-friendly
3. Scalability; system should meet growth in increased instruction capacity/bandwidth and user volume
4. Administrative capability; system should include certain primary functions such as registration, tracking, curriculum management and feedback mechanism
5. Compatibility and interoperability; system can be integrated well with third party content providers and multiple vendors; and complies with open industry standards (SCORM, IEEE; etc.); and, has the capability to integrate future trends such as reusable learning objects
6. High availability and product stability/reliability; to run 24x7 reliably
7. Security; system selectively controls access

B. Survey results

Our surveys focused on four primary entities of users: students, tutors, the IT Group, and the IT System Administrator. In this section, we reflect their opinions as system users. The posed questions contained in the surveys reflect the seven items of criteria described in part (A) of this section. The questions posed to the IT team were presented to them as both designers and daily user of the system.

The IT Administrator and his IT Group think, and perhaps rightly so, that an integrated system may suffer with regard to system security and reliability as one malfunction may end up affecting other components of the system. On the other hand, the integrated system supports the generation of comprehensive, holistic reports more easily. Furthermore, web content authoring needs to be added to the system as another important function.

The proprietary software, Copy Catch, intended for screening and combating plagiarism has been incorporated into the LMS as an integral part. Though experience with this software is still brief, it is, nevertheless, hoped that it will work effectively both as a screening mechanism and as a deterrent.

In order to assess user satisfaction on a rather large scale, we designed a special survey form that we posted online for students and tutors. By design, we used the same form for both groups of targeted users. We used a five-point scale for rating the responses; five being highest (excellent situation), and one being lowest (poor situation). We realize that it is hard to decide what the acceptable rate should be. We also recognize that the acceptable rate should be tied to the question posed. Keeping this in mind, we thus make a brief presentation of the results emanating from said survey. On average, ratings made by the tutors were higher than those made by students. Ease of system access and navigation ranked highest with both groups, at about 3.9 by the tutors, and 3.4 by students. System reliability (i.e., continuity of availability) also ranked reasonably high,

at 3.6 by tutors and at 3.3 by students. Regarding system security, the question was posed to the tutors, and not the students. Tutors ranked this feature at 3.7. In responding to another question, both groups see it useful to include practice tests for the courses. This is one of the next initiatives in the plans for system upgrading.

Obviously, a valid question ensues. If we were to assign a grade for the system performance with users, we would put it at B- (B minus). We believe that the LMS has many useful and pleasant features of application, but it seems to require further improvement

Moving ahead; the arrival of learning objects

The next phase of major development includes the introduction of reusable learning objects [4] as part of the LMS.

- A learning objects is defined as "any digital resource that can be used to support learning."
- A learning object is thus a small unit of material, usually prepared in a digital form for use on the Internet. As reusable objects, these units may be reused in a variety of courses as applicable. Thus, providing the units of material online makes it easier for learners and course designers to tap into them.
- Reusable learning resource design can, in turn, be thought of in terms of context, pedagogy, structure and presentation.

With these thoughts in mind, our next mission is underway for building a repository of reusable learning objects to the benefit of a variety of courses and programs of study. We think of the use of learning objects as an interdisciplinary approach to the sharing of knowledge.

References

1. Ref.: Sheila Brandt, et. al., "Ocotillo Paper: Learning Management Systems"; May 2003; at www.mlci.dist.aricopa.edu/ocotillo/papers/index.php?yr=0203&id=3
2. Ref. "edutechwiki; at http://edutechwiki.unige.ch/en/Learning_managemtn_system
3. Jake E. Lee, "eLearning-Real Returns on Investment"; 5 July 2002; at www.kmsi.us/whit_paper01.htm
4. Reusable learning objects; at www.reusablelearning.org/index.html