

E-Learning System for Graduate Program Of Central Philippine University

*Pedro Peter Rhys B. Cambronero Jr.

ABSTRACT

This study aims to develop an E-learning system for the Graduate Program to address teaching-learning issues. This system is a significant tool in helping instructors, students and department heads as they can manage and monitor classes online with facility, effectiveness, and efficiency. The system for the Graduate Program includes course management, classroom management, learning management, online assessment management, monitoring message board for communication, course feedback for instructors, and virtual classroom for discussion. RAD (Rapid Application Development) was applied in developing this system. This model is a team-based technique that focuses on fast information system development for the construction of prototypes which allow users to examine a working model as early as possible, to determine if it meets their needs, and to suggest necessary changes. The model includes phases of planning, analysis, prototype cycle, design, implementation and deployment. After the system was done, a questionnaire was given to the respondents. The questionnaires were taken from ISO standard questionnaires for evaluating systems functionality, reliability, usability, efficiency, maintainability, and portability. After the evaluation was done, it was found out that all aspects of the system were rated above the average which indicates that the system complies with all the necessary functionality and features of an E-Learning System. Thus, the system can be implemented in the Graduate Program of Central Philippine University.

Keywords: eLearning System, Graduate Programs, RAD (Rapid Application Development)

Introduction

Distance learning or so-called e-learning has become the dominant form of education. The demand for the use of the alternative approach to the typical classroom setting is widespread. Universities need to consider cost-effective and efficient methods of operation. The current Classroom Management System of the Graduate Program of Central Philippine University is done

manually with the use of a traditional class record. This record contains all necessary information regarding a specific class. It includes the record of each student with his attendance, scores, and grade components. Checking and administering of exams are done manually by instructors who find it tedious with a large class size. At the end of the semester, grades are submitted to the school record

system, and final grades are mailed to the student each semester. Distribution of class materials uses a traditional way by means of photocopying. Classroom discussions are done in a conventional way (face to face or 100% in person), in which instructors discuss lessons and students collaborate and exchange ideas inside the classroom. Instructors use whiteboards as a tool in writing the topics and illustrations. Also, bulletin board announcements are made manually. All reports are subject to the approval of the Dean of the college. Moreover, communications between instructor and students rely on email (e.g., Yahoo mail and Gmail) and Social site, (e.g., Facebook) or sometimes on mobile phones. Submission of requirements and assignments are also done by email or by personal submission in the department.

The following are the different problems encountered by both students and instructors in the current learning process done inside the classroom:

1. Availability of online materials is limited;
2. The traditional classroom management arrangement is not flexible with the working schedule of students;
3. There is no portal that allows students to view their academic progress online;
4. Faculty members have a hard time informing or updating their students regarding class-related activities;
5. Students have difficulty in continuing their studies in the university when they leave the country or if assigned in another place.

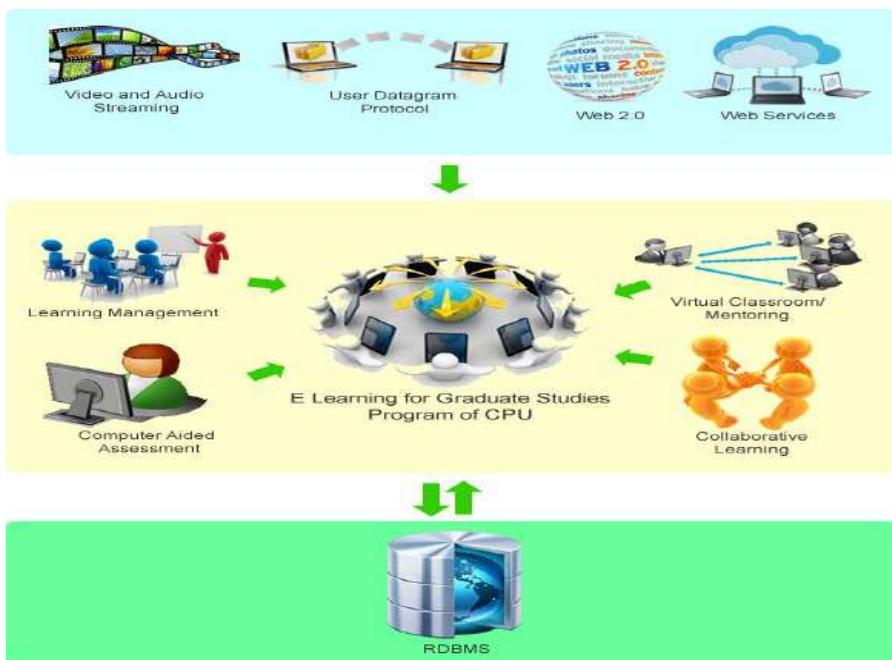


Figure1. Conceptual Framework of E-learning System

To address these difficulties, an e-learning system was developed for the Graduate Program of Central Philippine University. This e-learning became a solution to problems on course management, classroom management, learning management, online assessment, monitoring message board for communication, course feedback for instructors, and virtual classroom for discussion.

Methodology
Rapid Application Development Model

Rapid Application Development was used in developing the E-Learning System. This model is a team-based technique that focuses on fast information system development for the construction of prototypes which allow users to examine a working model as early as possible, to determine if it meets their needs, and to suggest necessary changes. Based on user input, the prototypes are modified, and the iterative process continues until the system is entirely developed and users are satisfied.

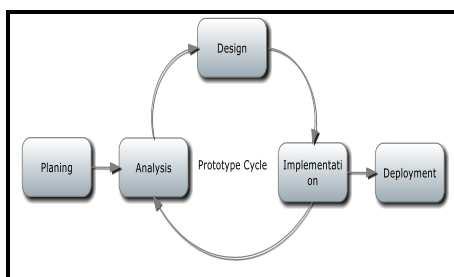


Figure 2. Rapid Application Development

System Implementation

The primary purpose of this phase is for the construction and documentation to develop or modify the system. Activities in this phase include the development, testing and

debugging, installation, and user evaluation of the developed or modified system. Development is the activity for constructing/coding the programs that serve as the building blocks of the proposed system. After coding, each module will then be tested and debugged to ensure that it functions properly. The program is evaluated by the user and is used as the basis for modification of the proposed system. If the system is already verified by the user, he/she must sign the acceptance form for approval.

System Deployment

Integrated system performance and its functional requirements as specified in the system are checked in this phase.

The software is presented to the MSCS course of a graduate program of the College of Computer Studies to test the system and determine whether the system can satisfy their needs, and also to identify errors and missing requirements of the system.

To support the study, a survey was conducted to the Personnel of UCSC and MIS Department at Central Philippine University and students, and instructors of MSCS course under the College of Computer Studies. Respondents were composed of four (4) experts, four (4) instructors and nine (9) students under the College of Computer Studies. This set of evaluation was taken from ISO 9126 which is an international standard for the evaluation of software. The standard is divided into four parts which address, respectively, the following subjects: quality model, external metrics, internal metrics, and quality in the use of metrics. ISO 9126 Part one, referred to as ISO 9126-1 is

an extension of previous work done by McCall (1977), Boehm (1978), FURPS and others in defining a set of software quality characteristics.

Questionnaire Designer Phase

The questionnaire designing phase starts after the E-Learning system is done which gives users a chance to interact with the system and to have a better understanding of the whole e-learning system. The questionnaires were taken from ISO standard questionnaires for evaluating systems functionality, reliability, usability, efficiency, maintainability, and portability. Each criterion has its own set of questions. All questions are close-ended, which covers different aspects of systems evaluation. Questions can be answered in 5 choices: 5 for excellent, 4 for very good, 3 for good, 2 for Poor, and 1 for very poor. In addition to close-ended questions, the questionnaire also requires the respondent's name and type of evaluator which is divided into 3 groups - expert, instructor, and student. Evaluator's name and comment are optional. These can be left blank if no comment or name is provided. The overall questionnaire pattern and format is clearly presented.

Results and Discussion

Analysis of Questionnaire

The respondent's responses to each question and each group were calculated to get the accurate results. The data obtained from the questionnaire are then tabulated to show their statistical values.

Close-ended Questions

This section presents a comprehensive view of the feedbacks with the aid of tables.

The table below shows the rating for each question per aspect, rated above average in which out of 18 questions, 12 are rated "excellent", and six (6) are rated "very good" by the evaluators.

Table 1
E-Learning System Evaluation Result on its Functionality, Reliability, Usability, Efficiency, Maintainability and Portability

Criteria	Rating
Functionality	
The software works according to its specifications.	Excellent
The software shows the correct information/data accessed by the user.	Excellent
The software interacts with other components or systems.	Excellent
The software complies with the industry/government laws and guidelines.	Very Good
The software protects its information and property.	Excellent
Reliability	
The system is capable of maintaining its level of performance.	Very Good
The software provides correct link process.	Excellent
The software can re-establish or recover the data in case of failure.	Excellent
Usability	
The software provides easy recognizable logical concepts.	Excellent
The software requires minimal effort when used.	Excellent
The software operates according to what the user expects.	Excellent
Efficiency	
The software requires less time in processing.	Excellent
The system performs actions accordingly based on resource used.	Excellent
Maintainability	
The software bears on risk of unexpected effects of revisions.	Very Good
The ability to minimize the effort in changing /modifying the system.	Very Good
The ability to minimize effect in verifying /testing a system change.	Excellent
Portability	
The software is easy to transfer to another environment.	Very Good
The software can adapt to different environments without applying other functions.	Very Good

The data below shows the overall rating of all aspects of the systems. It shows that all aspects of the system were rated above the average which indicates that the system complies with all the necessary functionality and features of an E-Learning System.

Table 2
Overall Assessment Result of the E-Learning System

ASPECT	RATING
Functionality	Excellent
Reliability	Excellent
Usability	Excellent
Efficiency	Excellent
Maintainability	Very Good
Portability	Very Good

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

E-Learning for Graduate Studies Program was designed to serve a tool to enhance classroom instructions and management.

This study applied E-learning concepts and set objectives to give solutions to problems encountered by students and their and instructors in the current learning process. It can create modules to (1) store and manage online learning materials and manage student grades through online grade book; (2) manage announcements through online bulletin board and (3) easily access online materials which students can use

to participate in discussion through virtual classroom.

E-learning system was found to be a significant aid to enhance learning course and classroom management. Administrators could manage courses, subjects, curricula and instruction with facility. Through this online learning system and technology, instructors can create and manage their classes easily. Posting of assignments, exercises and custom scores can easily be achieved by instructors handling classes.

Discussions can be administered through virtual classrooms, where students and instructors log into the system and do web conferencing. The system also provides assessment, creation and activation where instructors can create and set schedule for online assessments. Students' grades can be accessed and viewed through online grade-book.

This study applied E-Learning concepts and set objectives to give solution to the problems with the traditional classroom instruction where reports and exams are misplaced by the teacher; availability of online learning materials is very limited; traditional classroom management is not flexible with the working schedule of professionals enrolled in the graduate program; there is not portal which allows students to view their academic progress; and faculty have a hard time updating their students on class-related activities; and students have difficulty continuing their studies when they leave the city or the country.

Conclusions

There is no doubt that introducing and integrating digital

technologies into education will surely enhance the learning process of the student, and will open up greater interactions between learners, study, work, home and community environments, simply because the learning environment can be extended into those places. Using a web-based E-Learning provides the student the flexibility to access information. Instructor and student could easily find time to discuss lessons through web conferencing. Students learning outcome could be evaluated by instructors through online assessments. At the end of the semester, instructor's performance can be evaluated through online course feedback.

With the results of the surveys that were taken at ISO 9126 which is an international standard used for evaluating different aspects of the software (e.g.: functionality, reliability, usability, efficiency, maintainability, and portability), all areas were rated "above average," which simply shows that the system complies with all necessary functionality and features of an E-Learning System.

Recommendations

Despite the potentials and advantages of this E-Learning System to distance education, there are some problems that need to be resolved. These problems include the quality of instruction, misuse of technology, assurance, and equipment problem. Each one of these has a significant effect on the overall quality of distance learning as a product.

Quality of Instruction

The first problem to be resolved in implementing distance learning is the quality of instruction. Much of the quality of instruction depends on the attitude of the administration and the instructor. The data collected in a 1999 study by Elliot Inman and Michael Kerwin showed that instructors had conflicting attitudes about teaching distance education. They reported that after teaching one course, the majority of instructors were willing to teach another, but that they rated the quality of the course as only equal to, or lower in quality than other classes taught on campus. Moreover, it seems that the administration believes the technology itself will improve the quality of the class.

Misuse of Technology

Despite the full potential of the system, there is a possibility of users not utilizing it. These problems arise because of lack of training such as the instructor's defiance about using the technology. Still others encounter hardware problems, and with this, it seems too obvious that instructors need to be trained to be able to adapt the new environment of distance learning.

Reliability

Another issue on implementing E-Learning is the reliability of the results of assessment. Instructors must be assured that his students are actually the ones who are taking his online exams. Without the benefit of online monitoring, the result of online assessments will be unreliable.

Problems with Equipment

Dysfunctional equipment and hardware can be a great detriment to the success of distance learning. When a problem occurs many times, everything comes to a halt, the learning environment is interrupted, and the entire course is affected.

The following are recommendations for a successful implementation of E-Learning in the school of Graduate Studies:

1. E-Learning favors innovation and should be included in the training strategies of organizations and institutions to answer the increasing demand for trainer efficiency;
2. Communication campaigns must be given attention both internally and externally in the organizations and institutions (show of concrete successful and efficient experiences.)
3. Transparency is a must to users, especially in their data treatment, protection and use.
4. Motivation of the teachers and trainers is an essential element for the quality of e-learning (status recognition and career enhancement, and making them understand that it can facilitate their activities and teacher training);
5. Hardware must be properly monitored and maintained due to high bandwidth consumption;
6. The University is encouraged to acquire a high bandwidth and redundant internet connection for reliability and high availability of service and for critical operation.

References

- Barkley, E.F., Cross, K.P., & Major, C.H. (2005). Collaborative learning techniques: A handbook for college faculty. CA: Jossey Bass.
- Colvin, R. &Kwinn A. (2010).The new virtual classroom by Freedman, T.*The Amazing Web2.0*. E- Learning Book Review.
- Kats, Y. (2010). Learning management system technologies and software solutions for online teaching: Tools and applications.New York: Yurchak Printing.
- Moodle. (2014). The official page for modular object-oriented dynamic environment documentation and downloads. Retrieved from Moodle.org.
- Musa, K., &Alkhateeb, J, (2013). Quality model based on cots quality attributes. *International Journal of Software Engineering &Applications (IJSEA)*, 4, (1). Retrieved from <https://www.researchgate.net/publication/260391390> costquality
- Musumeci, G.P.D., &Loukides, M. System performance tuning. (2014). Retrieved from [www.amazon.com/System-Performance-Tuning- Help...ebook/.../B0043EWTVM](http://www.amazon.com/System-Performance-Tuning-Help...ebook/.../B0043EWTVM)

- Newberry, B. (2001). Raising student social presence in online classes. *WebNet2001 Proceedings* (In Press). Retrieved from <http://learn.gen.org/Resources/lgend101norm/200/210/2113.html>
- O'Hare, D. & MacKenzie, D. (2007). Advances in computer-aided assessment. *Learning Management System Technologies and Software Solutions for Online educational development series* (116-220).
- Sanders, W. (2008). Learning Flash Media Server 3. *Cascading Style Sheet Design*. Retrieved from website: <http://www.w3schools.com/css/>
- The Inquisiq (<https://www.inquisiq.com/what-is-a-learning-management-system-lms/>)