

An Integration of E-Learning System in Higher Education Institutions

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Abstract

This paper presents a study about some background information behind E-Learning concept, how it differs from the traditional method of teaching, how it is presented, and how it evaluates the effectiveness of the E-Learning system at Higher Education Institutions (HEIs). HEIs provide multicultural and multidisciplinary environments to the students to create environments for Knowledge and skills for innovative and complex problem solving through E-Learning methods which encompass a wide-concept of learning. E-Learning delivery system is On-line, students and instructors are not required to meet in the same place. The E-Learning delivery system will be blended learning. Blended learning is a combination of on-line and face-to-face learning. The instructor will only guide the students in their learning process. E-Learning environments aim to improve if not replace the traditional teaching methods, wherein the instructor discusses a particular topic and the students merely listen. With E-Learning system students can study on their own depending upon the pace of their ability to learn, thus making the instructor free from supervision of individual students.

Keywords: E- Learning, HEIs

1. INTRODUCTION

The traditional learning environment has established a prevailing type of the educational process within the Higher Education Institution (HEIs) for many decades. Higher Education Institutions will never stop finding new innovative ways to provide quality education to students. Over the last 20 years, computer-based learning has gradually revolutionized and revitalized in the higher education institutions sector, becoming an icon of the 21st century higher education provision [1]. The main reason is only for technologies to expand opportunities regarding extreme development in communication technology. The development of information-communication technologies has created a new dimension to the learning process and made E-Learning a significant learning option. It is one of the most dynamic and enriching forms of learning [2], reducing dependency on space and time. On the other hand, it offers both individual learning experiences, and opportunities to work together [3]. The E-Learning system is indeed a very promising tool that will equip students with the knowledge needed and be competent enough to cope up with continuous advancement of Information Technology. E-Learning is not just about online learning, it is also using a technology within a traditional campus based course adding value to the learning experience as well as supporting new ways of learning. E-Learning can help to provide a more

flexible learning environment and provide a learner-centered view of learning by providing interactive tutorials. The use of an integration of E-Learning and development course will definitely allow students to have an on-line interaction and gain the needed tools to learn the subjects more effectively. It will also serve as a development tool for the faculty because it aims to encourage them to adapt a new and sophisticated way of teaching using advanced technology such as the Internet.

2. THE PROBLEM AND ITS SETTING

Students and instructors are eager to face changes in the methodologies of education. The current generations are exposed lot of technologies that students want to experience. The race against technology is a game no one can ever win for in this digital age of globalization, technologies become passé as they are introduced. We can observe that Education is presented side-by-side with technology. Instructors use the very traditional method of teaching with the use of paper and pencil to instruct the students. The blackboards, books and whiteboards came up to serve as teaching tools for the instructor. Instructors used different kinds of methodologies like class lectures, class discussions, recitation and film viewing. The 1990s made a great contribution in the significant changes in Education

methodologies. In the middle of the 1990s the surging popularity of the Internet made new grounds by providing multimedia information, regardless of time and distance. Nowadays, the concern is no longer on whether higher education institutions should utilize technology inside their classroom set-ups to meet the learning objectives. The focus should be shifted in finding ways to maximize the benefits of these technology resources to mold students into competitive individuals, able to adapt to the increasing demands of time. With the recent growth of the Internet and distance learning, HEIs programme becomes an attraction and expanded the educational opportunities available to students and instructors. The need to integrate technological knowledge in Education has been recognized. The concept of E-Learning or electronic learning has been established to address the needs in Education, which is integrating the utilization of electronic materials to learning. E-Learning is learning what to do—how to map situations into actions. E-Learning provides a proposed Integration of E-Learning in all courses to satisfy the needs of students.

3. THEORETICAL FRAMEWORK

The move to on-line technologies is an evolving and dynamic process of investigation particularly in examining the ability of such technologies to improve the teaching and learning process. The proponent used the Badrul Khan's blended E-Learning framework, referred to here as Khan's *Octagonal Framework* which enables one to select appropriate ingredients. Khan's framework serves as a guide to plan, develop, deliver, manage, and evaluate blended learning programs. A variety of factors are required to be addressed to create a meaningful learning environment. Many of these factors are interrelated and interdependent. A systemic understanding of these factors can enable designers to create meaningful distributed learning environments. These factors comprise the Octagonal Framework. The framework has eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical which are indicated in Figure 1.

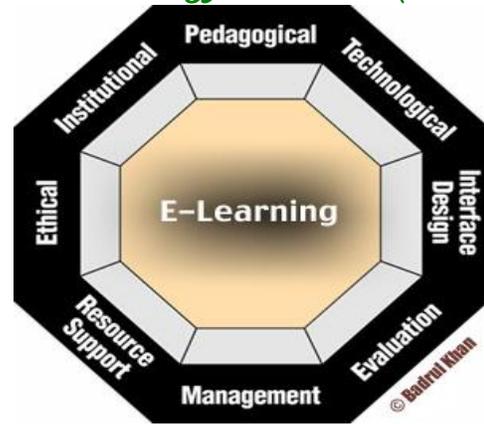


Figure 1: Khan E-Learning Framework

Each dimension in the framework represents a category of issues that need to be addressed. These issues help organize thinking, and ensure that the resulting learning program creates a meaningful learning experience.

3.1 Institutional

The Institutional dimension addresses issues concerning organizational, administrative, academic affairs, and student services. Personals involved in the planning of a learning program could ask questions related to the preparedness of the organization, availability of content and infrastructure, and the needs of the learners.

3.2 Pedagogical

The Pedagogical dimension is concerned with the combination of content that has to be delivered (content analysis), the learner needs (audience analysis), and learning objectives (goal analysis). The pedagogical dimension also encompasses the design and strategy aspect of E-Learning. This dimension addresses a scenario where all learning goals in a given program are listed and then the most appropriate delivery method is chosen.

3.3 Technological

Once we have identified the delivery methods that are going to be part of the blended learning program, the Technology issues need to be addressed. Issues include creating a learning environment and the tools to be used to deliver the learning program. This dimension addresses the need for the most suitable learning management system (LMS) that would manage multiple delivery types and a learning content management system (LCMS) that catalogs

the actual content (online content modules) for the learning program. Technical requirements, such as the server that supports the learning program, access to the server, bandwidth and accessibility, security, and other hardware, software, and infrastructure issues are addressed.

3.4 Interface Design

The Interface Design dimension addresses factors related to the user interface of each element in the blended learning program. One needs to ensure that the user interface supports all the elements of the blended learning program. The interface has to be sophisticated enough to integrate the different elements of the blended learning program. This will enable the learner to use each delivery type and switch between the different types. The usability of the user interface will need to be analyzed. Issues like content structure, navigation, graphics, and *help* also can be addressed in this dimension. For example, in a higher education course, students may study online and then attend a lecture with the professor. The blended learning course should allow students to assimilate both the online learning and the lecture equally well.

3.5 Evaluation

The Evaluation dimension is concerned with the usability of a blended learning program. The program should have the capability to evaluate how effective a learning program has been as well as evaluating the performance of each learner. In a blended learning program, the appropriate evaluation method should be used for each delivery type.

3.6 Management

The Management dimension deals with issues related to the management of a blended learning program, such as infrastructure and logistics to manage multiple delivery types. Delivering a blended learning program is more work than delivering the entire course in one delivery type. The management dimension also addresses issues like registration and notification, and scheduling of the different elements of the blended learning program.

3.7 Resource Support

The Resource Support dimension deals with making different types of resources (offline and online) which will be available for learners. Resource

support could be a counselor/tutor who is always available, or available via the e-mail, or chat system.

3.8 Ethical

The Ethical dimension identifies the ethical issues that need to be addressed when developing a blended learning program. Issues such as equal opportunity, cultural diversity, and nationality should be addressed.

4. REVIEW OF THE RELATED LITERATURE AND STUDIES

In this paper, all related literature and studies are cited that are truly relevant to the study being undertaken. The topic is extensive that the gathered information's are subdivided through the following subtopics:

Hall (1997) defined web-based training as instruction that is delivered over the Internet or over a company's intranet. Accessibility of this training, related Hall, is through the use of a web-browser such as Microsoft Internet Explorer and Netscape Navigator. [4]

Hall and Snider (2000) define E-Learning as the process of learning via computers over the Internet and intranets. Hall and Snider extended that E-Learning is also referred to as web-based training, online training, distributed learning or technology for learning. [5]

Zahm (2000) described computer-based training (CBT) as usually delivered via CD-ROM or as a Web download and that it is usually multimedia-based training. [6]

Karon (2000) discussed the convenience factor of well-designed computer-based training by saying that any well-designed computer-based training- whether it's networked based or delivered via the Internet – is more convenient than traditional instructor-led training or seminars. [7]

Hall (1997) incorporated both **Zahm (2000)** and **Karon (2000)** definitions by underlining computer-based training as an all-encompassing term used to describe any computer-delivered training including CD-ROM and World Wide Web. Hall further

explained that some people use the term CBT to refer only to old-time, text-only training. Many researchers agree that technology will never replace trainer or instructional designers, but technology brings with it more demands for teamwork and collaboration among a diverse group of workers [8].

4.1 Online Learners

Like trainers, the role of the learner is changing. Traditionally, students meet instructors face-to-face in a physical setting, with E-Learning, students meet instructors virtually via electronic media. Certain learner-related issues must be discussed when considering an E-Learning platform in any organization. This section reviews and discusses the following issues: learning styles; learner's attitude towards using technology; desirable learner's skills; online interaction and communication. This section concludes with an overview.

4.2 Learning Style and Computer-Mediated Learning

Learning style has been defined by Keefe (1979) as "the characteristic behaviors of learners that serve as relatively stable indicators of how they perceive, interact with, and respond to the learning environment." There are many learning theories and corresponding learning style measurements. Different learning style theories and measurement focus on different levels of a person's characteristics. [9]

4.3 Learner Attitude towards using Technology

Learners' perceptions about the characteristics of instructional delivery media and their ability to learn using these media have been shown to be key determinants in predicting student motivation and success in traditional classrooms[10][11]. These perceptions may also be equally important when implementing computer technologies as the major source of information transfer to students in computer mediated learning environments.

4.4 Desirable Online Learners' Skills

Eastmond (1995) pointed out that self-directed learning is a desirable trait and function of not only learners but also of instructional facilitators and the sponsoring institution. Indeed, this is important if E-Learning is to encompass formal, informal, planned

and unplanned learning. For an organization to be conducive to the sharing of tacit knowledge, for example, self-directed learning is crucial. Self-directed learning is the impetus of organizational learning at all levels. [12]

4.5 Online Interaction and Communication

Overall, learning styles, attitude towards using technology, online learner skills and online interaction and communication are some important factors that need critical consideration when planning, designing and implementing an E-Learning system. Learners need to be valued and taking time out to review the issues discussed above is just the beginning of the valuing process and of your E-Learning program's success.

4.6 Evaluation of E-Learning

One of the most common training evaluation approaches is the Kirkpatrick model, which was first established in 1959. Kirkpatrick's model is a four level process used to determine the effectiveness of training in order to improve future programs and to eliminate programs that are ineffective.

Kirkpatrick (1996) defined the four levels of evaluation as follows:

Level 1 evaluation, Reaction, involves measuring how participants react to or feel about a training program. This is basically a measure of customer satisfaction.

Level 2 evaluation, learning, measures the extent to which participants' knowledge, skills, and attitudes change as a result of training.

Level 3 evaluation, Behavior, examines the extent to which change in behavior has occurred because of attending a training program.

Level 4, Results, can be defined as the final results that occurred because students or learners attended the training program. [13]

4.7 Training Effectiveness in E-Learning

Determining which sources of information are the most relevant and important to E-Learning effectiveness. There are many variables been examined to measure the effectiveness of E-Learning which includes learner satisfaction, technology satisfaction, and measuring learner outcomes.

4.8 Learner Satisfaction

Learner satisfaction has been found to be an important component in the effectiveness of E-Learning systems, thus, the importance given to learner experiences. The learners' level of satisfaction with the media and processes used to create the learning environment plays upon the learners' desire to participate in future E-Learning courses. Because learner satisfaction is a major component of successful training and particularly important to E-Learning courses, careful analysis of the different aspects of learner satisfaction is an important component of evaluating E-Learning courses. [14]

4.9 Participation and Interaction

Communication and interaction among learners in educational or training course is a very important component of effective instruction. Interaction allows students to learn from one another and from the instructor. Thompson (2000) suggested that procedures for out of class communication between learners and instructor is important, because students are potentially geographically dispersed in e learning courses. Special attention must be focused on building interaction and communication into course design. [15]

4.10 Feedback

The amount and quality of feedback provided to the learner has an impact on learner satisfaction. Feedback is particularly important to the effective delivery of e learning courses. E-Learning delivery methods such as web-based instruction can provide barriers to traditional type classroom feedback. For instance, in a web-based course learners cannot simply raise a hand and ask for clarification about a point made by the instructor. Hence, the design and integration of feedback mechanisms impact the learners' experience and level of satisfaction. According to Neal & Ingram (1999) distance learners do not receive the day-today feedback available in traditional classroom settings. Instructor-student feedback is important as it helps the instructor to gauge the level of student satisfaction regarding a topic or an entire course. Because of the loss of traditional classroom feedback in E-Learning environments, other methods to assess learner satisfaction need to be administered. [16]

4.11 Technology Satisfaction***4.11.1 Curriculum Delivery Methods and Preferences.***

There are many methods used to deliver E-Learning courses. Web-based, CD-ROM, satellite, teleconferencing, and television are some of the more common delivery methods. Goodwin (2000) also supported this perspective by stating that instructor and curriculum quality, whether training in a traditional classroom, two-way video conferencing, or via a web-based environment, ultimately determines the effectiveness of a training or education intervention. A good curriculum can potentially make up for poor quality media, but it doesn't work the other way around.[17]

4.11.2 Learning Environment

According to Thomas (2000), success in technology-based learning programs is based on an orientation to the learner not the instructor. A strong focus on the learner and the learning environment is a shift from traditional instructional design and development techniques.[15] Norton and Wilburg (1998) believed that learner-based tools should be selected based on the way that they help students learn. The most important thing is how well the tool supports the learning process. [18]

4.11.3 Interface Design

User interface design is important whether delivering training synchronously or asynchronously. User interface design refers to the overall look and feel of the program that allows learner to access information [4] Identifying what navigational tools are most user-friendly and where to place information are concerns associated with the design of the user interface.

4.11.4 Measuring Learner Achievement

The goal of any learning activity is for learning to take place. A common way to measure the effectiveness of instruction is to measure learner achievement. Measuring learner achievement in E-Learning environments requires special attention. A key aspect of some E-Learning applications, such as CD-ROM and web-based applications is that it allows for personalized instruction. Instructors can be informed about different learners' instructional objectives.[19] Learner achievement may be based on different learning objectives. The use of electronic

mediums can even make grading of tests and quizzes easier because scores can be tabulated immediately following the completion of a quiz or test, providing quick and accurate feedback to learners.[19]

4.11.5 Blending

The movement to blend classroom approaches with E-Learning is growing. An instructional designer for E-Learning courses are finding that blending, or live E-Learning, is often done to enhance the quality of the learning experience. Blending refers to an online learning course that is held at a specific time.

5. PARADIGM OF THE E-LEARNING STUDY

The dimension of value adding E-Learning combines the three major dimensions to form an effective and efficient way of imparting knowledge to students in a more tested and defined manner. The E-Learning system will use the three dimensions as basis for creating an effective tool in educating students. It will be developed, equipped with specific rules; knowledge embedded using IT and dynamic functionalities to facilitate the need of the users. The paradigm of the E-Learning is shown in Figure 2.



Figure 2. The paradigm of the E-Learning study

The **Application Integration Dimension** summarizes for the E-Learning platforms the capacity of collaboration with other business applications in order to obtain learning content from real business operations. This dimension seems to be the less detected on the common E-Learning platforms and this causes a number of gaps for the effective implementation of E-Learning systems. The critical issue of insufficient content in many situations is due to the inability of the organizations

to establish a knowledge generation mechanism through the operation of information systems that support the most important business processes. In general, the E-Learning systems in corporate environments can play the role of the most significant intellectual capital exploitation mechanism.

The **Knowledge Management Sophistication** summarizes the ability of the E-Learning platform to manage learning content in various formats, to re-use learning modules and to support knowledge management processes such as knowledge creation, knowledge codification, knowledge transformation and knowledge diffusion.

The **E-Learning Dimension** stands for the ability of an E-Learning system to construct effective learning mechanisms and learning processes that support the achievement of different educational goals. With no doubt this dimension incorporates issues like learning styles, learning needs, learning templates as well as learning specification settings.

6. RECOMMENDATION OF E-LEARNING SYSTEM REQUIREMENTS

The facts all states that an E-Learning can easily help the students to cope up with the ever changing pace of education. The following recommendation will be implemented in accordance to the proper installation of the system.

- It is needed that it should use a high speed pc to allow students to easily go and play pages faster.
- The system will be more effective if the media are all available.
- The system can be integrated as part of the curriculum of any information technology courses.
- The system can be used by other researchers to help them in improving the learning development skills of the students,
- That the system can be modified in the near latter years.
- Geographical barriers are eliminated, opening up broader education options.
- It is found effective upon the evaluation of the respondents that it delivered its purpose of providing better learning for students.
- 24/7 accessibility makes scheduling easy and allows a greater number of people to attend classes
- On-demand access means learning can happen precisely when needed.

- Overall student costs are frequently less (tuition, residence, food, child care).
- Potentially lower costs for companies needing training, and for the providers.
- Fosters greater student interaction and collaboration.
- Fosters greater student/instructor contact.
- Enhances computer and Internet skills.
- The System needs to represent voice and display quality.
- Draws upon hundreds of years of established pedagogical principles.
- Has the attention of every major university in the world, most with their own online degrees, certificates, and individual courses.
- Learning is self-paced (not too slow, not too fast).
- You're unbound by time - courses are available 24/7.
- You're unbound by place - study at home, work, or on the road.

7. OBJECTIVES OF THE E-LEARNING SYSTEM

The general goal of the proposed project is to develop an E-Learning System in all courses should be integrated in the higher education institution websites that will greatly benefit the students as well as institution itself. E-Learning System needs a number of online services to assist and support the learners at the HEIs. These support services involve the following features:

Valuable Interactive Course Material (On-Line Reading)

The content of the courses is presented to the learner in an interactive manner that leads to greater retention of the covered material; it accommodates different learning styles through audio and visual graphics. The content of the lessons are simplified lessons and step-by-step procedures easily understood by the learner.

On-Line Quizzes/Exams

Learner will take the quizzes and exams on-line after reading the modules on-line based on the given schedule. On the integration of E-Learning in the curriculum the student will take the quizzes at the end of the chapter. The student will be evaluated from through On-line quizzes and exams. The instructor

activates the Quizzes/Exam as scheduled. After taking the On-line quizzes and exam the student can view their grades through the electronic grade book.

Utilities

The system includes file maintenance and features for generating reports. File maintenance consists of adding, deleting and editing records of students and instructor. The system also generates reports like student master list that includes the instructor name, class schedule, lists of the student; grade of students, instructor and student information.

Interactive Drills and Exercises

Interactive exercises are included in the system to give the students more practice on the lessons and topics, and makes learning more fun.

Quiz and Examination manager

The randomized questions in every quiz and exam can be changed or edited by the instructor and the administrator.

Grading System

The system generates a grade in every quiz and exam taken to evaluate the performance of the students. In the integration of E-Learning in the curriculum where student and instructor meet and interact in the laboratory, the student will be graded based on the scores he got from quizzes per module and major exams.

Useful, Effective Help

An online user's manual is available for all learners to explain to the end-user the use of the E-Learning system.

Course Glossaries

Course glossaries are included for almost each course to easy understand by the learners the terminologies used in the system.

Index

It serves as a navigational tool within the particular chapter.

Links to Web Resources

Each course is associated with a number of web links that will allow you to get in-depth details about the course.

E-Learner Evaluation

One of the pillars of continuous improvement at E-Learning is based on getting feedback from all our e-learners about each single course and each single instructor that will be done after Finals.

Message Board

This allows the instructors to post messages about a certain topics on the subjects they handled as for the information of the students.

Community

The E-Learning system in general aims to provide the community an educational tool to promote learning and encourage learners by creating an interactive environment for them to learn effectively.

8. EVALUATION ON THE EFFECTIVENESS OF THE E-LEARNING SYSTEM

The administrator can evaluate the E-Learning system in the HEIs in terms of Database accuracy, Reliability, Managements, Ethical issues course and pedagogical. The evaluation criteria's in each term are indicated in Table-1.

Table-1: An Evaluation criteria for E-Learning system.

DATABASE ACCURACY	MANAGEMENTS
1. The speed of loading information.	1. The Administrator has the control over the accessibility of the system.
2. The speed of accessing information.	2. The administrator can update and maintain records with ease.
3. System is well secured through password protection.	3. The administrator can keep track of the student's progress.
4. Accuracy of saving records to database.	4. The system can track student submissions for quizzes.
5. Correctness in displaying information.	ETHICAL ISSUES
RELIABILITY	A. Equal Opportunity
1. There are no system errors, crashes, or dead links	1. The system allows adjustments for differences in learning speed such that it does not demand too much from the learner.
2. The courses and program information contained in the database is up-to-date and appears to be correctly classified	2. All users have an equal opportunity to give feedbacks, comments and messages through systems as long as bounded to the proper netiquette.
3. The keyword and advanced searches yield courses which match the search criteria.	B. Cultural Diversity
4. The quizzes for each course is administered such that the learners cannot cheat.	1. The system is presented in an objective manner without giving offense to anyone regardless of the culture of the users.
5. The Administrator/Instructors can generate up-to-date reports according to the requests.	2. The overall content of the system follows the proper netiquette.
6. Instructors can post messages through the message board to notify learners of relevant changes in the course.	C. Nationality
7. To maximize its features by means of giving voice over and animations in the terms of quality and clarity.	1. The system follows provisions for representation of concepts for a World Wide audience.
	2. The system is developed using universal language to easily understand by different nationalities.
EVALUATION BASED ON COURSES IN E-LEARNING SYSTEM	
1. E-Learning will fulfill the need for increased flexibility in teaching and learning tools.	8. E-Learning will fulfill the needs for increased expectations (Example of expectations: more feedback, more attention and more resources to help in learning process).
2. Web-based environment will potentially offer many opportunities for enriching the learning process.	9. E-Learning will generally perceive as more efficient and well-organized lessons

3. E-Learning will offers sequential independence (learning will be done anytime convenient to the students).	10. E-Learning will build a community that can be a great motivator for group learning
4. E-Learning will suits the rapidly change nature of knowledge.	PEDAGOGICAL
5. E-Learning will capitalizes on the information processing power of the computer (it is fully utilized to store, index, search, convert and distribute information).	1. The delivery of course content in appropriate media.
6. E-Learning will cope with instant scalability (Knowledge can be rolled out instantaneously to reach any increased number of students and contribute to overall productivity).	2. The system examples allow the students to better understand the subject matter.
7. E-Learning will offers a more exciting self-directed learning	3. The contribution of the assessment activities (exams, quizzes, drills) to the student's knowledge on the subject matter.

CONCLUSIONS

The global learning community is at your fingertips with online learning. The technologies give online instructional designers the ability to build tools that take you to resources that you may never see in a traditional classroom. E-Learning is self-paced and gives students a chance to speed up or slow down depending on their abilities. Learning is self-directed; it allows students to choose content and tools appropriate to their interests, needs, and skill levels. It accommodates multiple learning styles using a variety of delivery methods geared to different learners, which is more effective for certain learners. Most of the lectures are still using traditional teaching methods in HEIs, which is lecturer-centered. This study could be useful for HEIs for gaining some insights to E-Learning methods which includes the challenges and difficulties faced by both lecturers and students.

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