

ONLINE EDUCATIONAL SYSTEM (e- learning)

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Abstract

The intricate construction of online educational systems lies within three principal activities: Design, Implementation and proper Post-implementation Assessment. There is not enough knowledge or experience in those aspects. Efficient execution of these three major activities necessitates the use of design and educational models to achieve the cost and time efficiency, as well as high academic quality. Utilization of online educational systems would benefit from a structured approach to design, implementation, and student's assessment. We propose a general formulation of model as well as a framework for finding such patterns, so that it can improve the online educational systems for both teachers and students – allowing for more accurate assessment and more effective evaluation of the learning process.

Keywords: e-learning, information and communication technology

1. Introduction

We live in the era of Information Technology. We have to learn where we are? And equip us suitable to the changing scenarios. There is no end for the learning particularly to the academicians. 'Learning that is supported by information and communication technologies (ICT) is the new technology. Every academician must be aware of this. E-learning is, not limited to 'digital literacy' (the acquisition of IT competence) but may encompass multiple formats and hybrid methodologies, in particular, the use of software, Internet, CD-ROM, online learning or any other electronic or interactive media.'

E-Learning is defined as all forms of electronic supported learning and teaching, which are procedural in character and aim to effect the construction of knowledge with reference to individual experience, practice and knowledge of the learner. Information and communication systems, whether networked or not, serve as specific media to implement the learning process.

E-learning is essentially the computer and network enabled transfer of skills and knowledge. E-learning refers to using electronic applications and processes to learn. E-learning applications and processes include Web-based learning, computer-based learning, virtual classrooms and digital collaboration. Content is delivered via the Internet,

intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It is used by the educational Institutions to enhance and support the class room teaching and offering courses to a larger population of learners across the Globe. It can be self-paced or instructor led and includes media in the form of text, image, animation, streaming video and audio.

E-learning has created new markets for teaching and learning material and equipment, attracting the attention of academic institutions as well as companies supplying them in different sectors – computer manufacturers, software producers, publishing houses and special training providers. It has also led to the reorientation of government policy, in particular, towards encouraging the spread of e-learning techniques and developing the skills and know-how required for their use. Therefore, e-learning was assigned a key role in the pursuit of the policy objective, announced at the Lisbon Summit in March 2000, of making the ‘the most competitive and dynamic knowledge-driven economy in the world’. The e-learning initiative was launched by the European Commission to encourage its spread. This was followed by its incorporation into the European employment strategy in the form of a specific objective of ‘developing e-learning for all citizens’. To achieve this, States committed themselves to ensuring that ‘all education and training institutions have access to the Internet and multimedia resources by the end of 2001 and that all the teachers and trainers concerned are skilled in the use of these technologies by the end of 2002 in order to provide all pupils with a broad digital literacy’. Despite its central importance in government policy and significant interest in the scale of the actual and potential market, there is an acute shortage of quantitative information on the extent of e learning in providing initial and continuing vocational education and training and on the rate at which it is growing.

There is also an increased use of virtual classrooms (online presentations delivered live) as an online learning platform and classroom for a diverse set of education providers. In addition to virtual classroom environments, social networks have become an important part of E-learning. Social networks have been used to foster online learning communities around subjects as diverse as test preparation and language education. Mobile Assisted Language Learning (MALL) is a term used to describe using handheld computers or cell phones to assist in language learning.

2. Approaches to E-Learning Services

E-learning services have evolved since computers were first used in education. There is a trend to move towards blended learning services, where computer-based activities are integrated with practical or classroom-based situations.

Bates and Poole (2003) and the OECD (2005) suggest that different types or forms of e-learning can be considered as a continuum, from no e-learning, i.e. no use of computers and/or the Internet for teaching and learning, through classroom aids, such as making classroom lecture Power point slides available to students through a course web site or learning management system, to laptop programs, where students are required to bring laptops to class and use them as part of a face-to-face class, to hybrid learning, where classroom time is reduced but not eliminated, with more time devoted to online learning, through to fully online learning, which is a form of distance education. This classification is somewhat similar to that of the Sloan Commission reports on the status of e-learning, which refer to web enhanced, web supplemented and web dependent to reflect increasing intensity

of technology use. In the Bates and Poole continuum, 'blended learning' can cover classroom aids, laptops and hybrid learning, while 'distributed learning' can incorporate either hybrid or fully online learning.

It can be seen then that e-learning can describe a wide range of applications, and it is often by no means clear even in peer reviewed research publications which form of e-learning. However, Bates and Poole argue that when instructors say they are using e-learning, this most often refers to the use of technology as classroom aids, although over time, there has been a gradual increase in fully online learning.

2.1 Computer-based Learning

Computer-based learning, sometimes abbreviated to CBL, refers to the use of computers as a key component of the educational environment. While this can refer to the use of computers in a classroom, the term more broadly refers to a structured environment in which computers are used for teaching purposes. The concept is generally seen as being distinct from the use of computers in ways where learning is at least a peripheral element of the experience (e.g. computer games and web browsing).

2.2 Computer-Based Training

Computer-Based Trainings (CBTs) are self-paced learning activities accessible via a computer or handheld device. CBTs typically present content in a linear fashion, much like reading an online book or manual. For this reason they are often used to teach static processes, such as using software or completing mathematical equations. The term Computer-Based Training is often used interchangeably with Web-based training (WBT) with the primary difference being the delivery method. Where CBTs are typically delivered via CD-ROM, WBTs are delivered via the Internet using a web browser. Assessing learning in a CBT usually comes in the form of multiple-choice questions, or other assessments that can be easily scored by a computer such as drag-and-drop, radial button, simulation or other interactive means. Assessments are easily scored and recorded via online software, providing immediate end-user feedback and completion status. Users are often able to print completion records in the form of certificates.

CBTs provide learning stimulus beyond traditional learning methodology from textbook, manual, or classroom-based instruction. For example, CBTs offer user-friendly solutions for satisfying continuing education requirements. Instead of limiting students to attending courses or reading printing manuals, students are able to acquire knowledge and skills through methods that are much more conducive to individual learning preferences. For example, CBTs offer visual learning benefits through animation or video, not typically offered by any other means.

CBTs can be a good alternative to printed learning materials since rich media, including videos or animations, can easily be embedded to enhance the learning. Another advantage to CBTs are that they can be easily distributed to a wide audience at a relatively low cost once the initial development is completed.

However, CBTs pose some learning challenges as well. Typically the creation of effective CBTs requires enormous resources. The software for developing CBTs (such as Flash or Adobe Director) is often more complex than a subject matter expert or teacher is able

to use. In addition, the lack of human interaction can limit both the type of content that can be presented as well as the type of assessment that can be performed. Many learning organizations are beginning to use smaller CBT/WBT activities as part of a broader online learning program which may include online discussion or other interactive elements.

2.3 Computer-supported collaborative learning (CSCL)

Computer-supported collaborative learning (CSCL) is one of the most promising innovations to improve teaching and learning with the help of modern information and communication technology. Most recent developments in CSCL have been called E-Learning 2.0, but the concept of collaborative or group learning whereby instructional methods are designed to encourage or require students to work together on learning tasks has existed much longer. It is widely agreed to distinguish collaborative learning from the traditional 'direct transfer' model in which the instructor is assumed to be the distributor of knowledge and skills, which is often given the neologism E-Learning 1.0, even though this direct transfer method most accurately reflects Computer-Based Learning systems (CBL).

In *Datacloud: Toward a New Theory of Online Work*, Johndan Johnson-Eilola describes a specific computer-supported collaboration space: The Smart Board. According to Johnson-Eilola, a “Smart Board system provides a 72-inch, rear projection, touchscreen, intelligent whiteboard surface for work”. In *Datacloud*, Johnson-Eilola asserts that “are attempting to understand how users move within information spaces, how users can exist within information spaces rather than merely gaze at them, and how information spaces must be shared with others rather than being private, lived within rather than simply visited” . He explains how the Smart Board system offers an information space that allows his students to engage in active collaboration. He makes three distinct claims regarding the functionality of the technology:

- 1) The Smart Board allows users to work with large amounts of information,
- 2) It offers an information space that invites active collaboration,
- 3) The work produced is often “dynamic and contingent”

Johnson-Eilola further explains that with the Smart Board “...information work becom[es] a bodied experience”. Users have the opportunity to engage with—inhabit—the technology by direct manipulation. Moreover, this space allows for more than one user; essentially, it invites multiple users.

2.4 Technology-Enhanced Learning (TEL)

Technology enhanced learning (TEL) has the goal to provide socio-technical innovations (also improving efficiency and cost effectiveness) for e-learning practices, regarding individuals and organizations, independent of time, place and pace. The field of TEL therefore applies to the support of any learning activity through technology.

3. Learning Management System

It is a software application for the administration, documentation, tracking and reporting of training programmes, class room and on line events, e-learning programmes, and training content. It is designed to teach how e learning can be implemented and made effective using popular LMS Moodle. Moodle is a free and open source e learning software platform that means there is no cost or license fee for deployment. Moodle is designed to help educators create on line courses with a focus on interaction and collaborative construction of content.

3.1 Objectives

e-Learning represents an innovative shift in the field of learning, providing rapid access to specific knowledge and information. It offers online instruction that can be delivered anytime and anywhere through a wide range of electronic learning solutions such as Web-based courseware, online discussion groups, live virtual classes, video and audio streaming, Web chat, online simulations, and virtual mentoring.

E-Learning enables organizations to transcend distance and other organizational gaps by providing a cohesive virtual learning environment. Companies must educate and train vendors, employees, partners, and clients to stay competitive, and eLearning can provide such just-in-time training in a cost-effective way.

Developing and deploying effective eLearning programs may require products and services supplied by a variety of vendors, leaving one to connect the dots. One way to start is to define the goals of the desired learning solution. Definition of the goals of an eLearning solution is driven by the following factors:

Perform task analysis

Determine the tasks to be taught, identify subtasks and other elements involved, and identify the knowledge, skills, and attitudes required to complete the tasks efficiently and effectively.

Perform training needs analysis

Identify the target audience for the training. Identify the shortfall in knowledge, skills, and attitudes of this audience and determine what the target learners need to know.

Review existing capabilities

Review existing methods and infrastructure for providing training or meeting learning needs.

Determine expectations

Identify concrete expectations and/or ROI requirements from the desired eLearning solution.

The development of an eLearning strategy begins by setting goals. Without a true understanding of the goals of the eLearning strategy, it will be difficult, if not impossible, to be successful.

Before implementing eLearning, organizations need to set common goals or objectives. Common goals and objectives include the following:

To reduce learning costs

As a small business owner, you know that online transactions cost a fraction as much those requiring paper or staff. It's the same with eLearning because there are no papers, no delays, and no travel expenses.

To reduce the time required for effective learning Electronic learning is sometimes called "just-in-time" learning. Such learning enables employees to take what they have just learned from their computer screens and apply it to the tasks at hand.

To motivate employees

eLearning is considered an effective way to keep up with new technology, to generate new ideas, and to keep your workforce fresh and inspired.

To improve flexibility of course delivery

Most smaller businesses don't have the staff to manage their training and development initiatives. eLearning technologies can overcome these administrative restrictions.

To expand the capabilities of the business

Small organizations need to get more out of their high-potential employees. eLearning helps employers take these employees to a higher level of contribution.

Other goals and objectives include the following:

- To reduce the need for classroom training
- To track employee progress
- To track training effectiveness (or absorption)
- To link training with Knowledge Management
- To reduce time away from the job
- To improve job performance
- To support business objectives
- To make learning available anytime, anywhere

4. Methodology

Model used for Online Education Systems

The model used for online education systems are shown in Figure 1. This is partly due to the institutions' need to rationalize the operation to handle the growing number of online students and courses, and partly due to the fact that the users are increasingly expecting more sophisticated services.

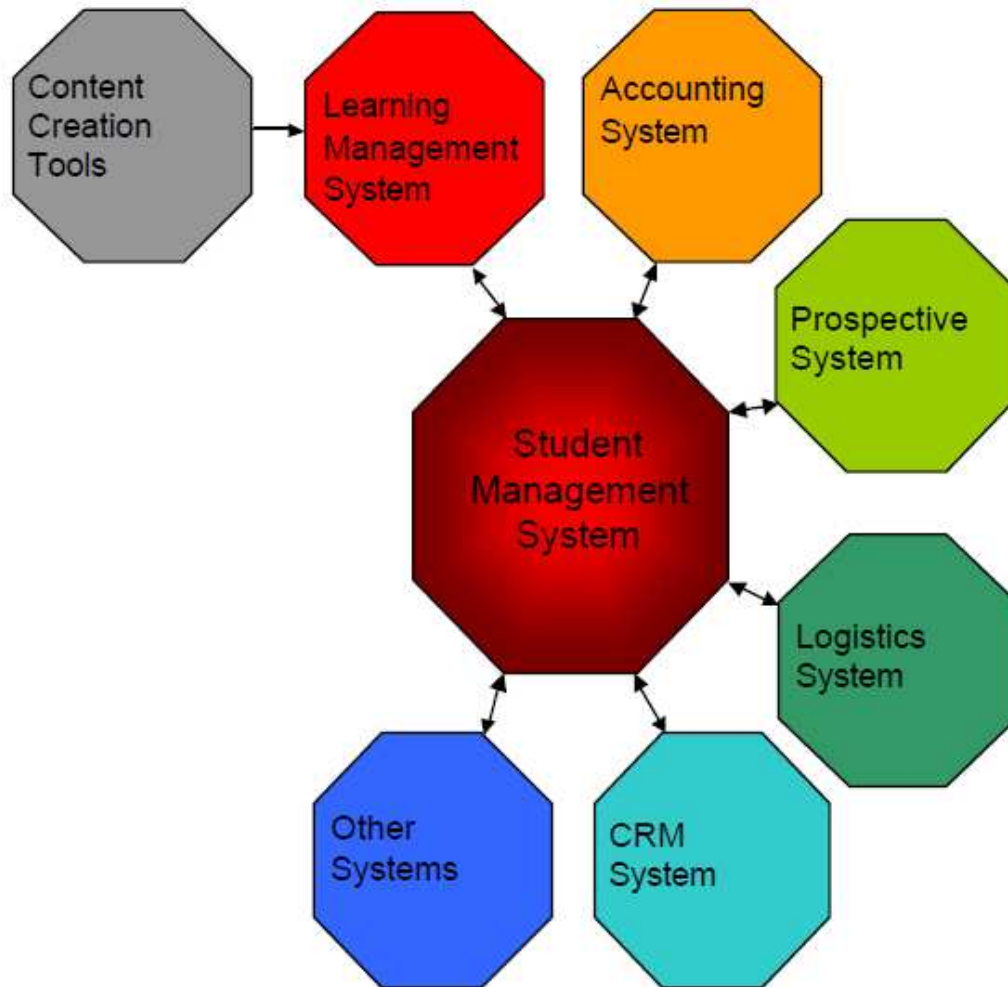


Figure 1. Model for Online Education Systems

This model includes Customer Relation Management (CRM) systems and prospective systems to show the need for integration with marketing and sales related systems. It also includes logistics systems to show that it could be necessary to integrate systems that handle shipment of textbooks and other physical material to distance students.

1. Target Population and Sample Size to be Covered

A study conducted in the fall of 500 College students at different areas in Tuticorin district and found that students attending survey come to college with most of them owning computers, having internet access, having studied computers in high school, and considering themselves to be intermediate computer users. These numbers indicated growth from similar studies conducted previously at minority institutions but were still lower than what has been reported in the studies conducted at majority serving institutions. Therefore, the survey can claim to give a more comprehensive view about e-learning in the Tuticorin District and its rate of development than has been available up to now.

2. Method of Data Collection

NSS & RRC students collected data in 4 levels. The methods for collecting data for Level 1 (reaction) and Level 2 (learning) can be built into the process much more easily. Because e-learners can be remotely located, some of the methods of data collection are more difficult to use, such as focus groups and direct observation.

3. Changes in skills (applied the learning to enhance behaviors)
4. effectiveness (improved performance because of enhanced behaviors)

Figure 2 shows the block diagram for method of data collection.

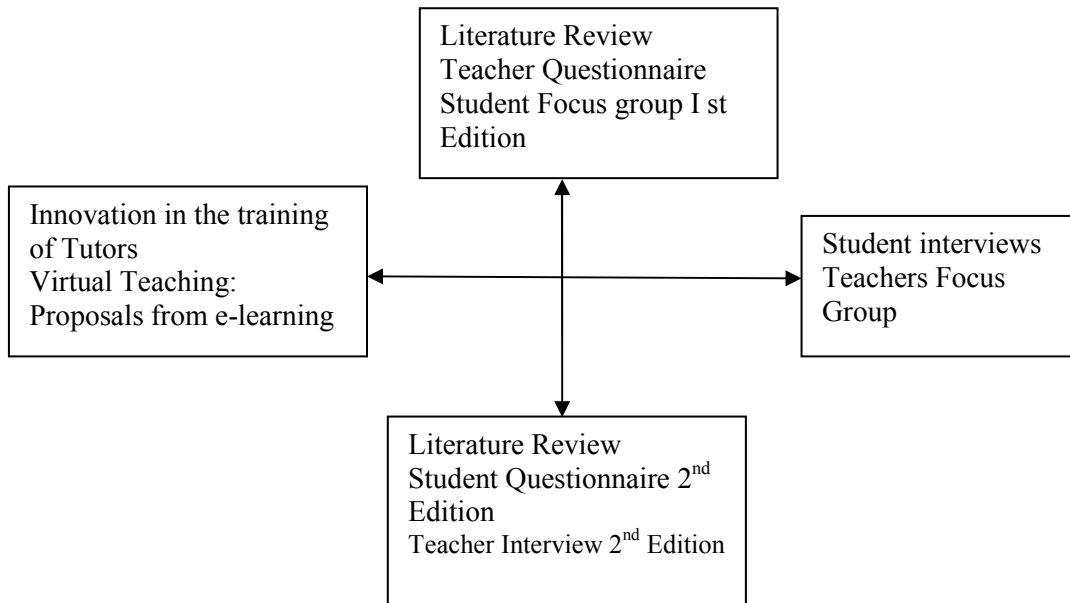


Figure 2. Method of Data Collection

3. Sources of the data

The data used for the study are obtained from several sources:

- (a) headquarter and field interviews;
- (b) surveys among the Faculties, students, students' supervisors, managers of training centres
- (c) module content analysis;
- (d) document reviews
- (e) Learning Management System (LMS). LMS is a management tool used at each training centre to register new students, create a customized course menu, and obtain standard student enrolment/performance reports.

Primary Data :

Primary data is that which is used empirically, that is, analysis of this data leads directly to particular themes or conclusions. The primary data is that which was specifically sought for the purposes of the research. They are Interview records,

discussion board messages, Message statistics, access data, and questionnaire statistics.

Secondary Data:

Secondary data is that which is used to support the findings of the primary data. The secondary data is that which was a “by-product” of the research; that is, it was not specifically required for the research. They are Email messages, tutor’s log, Access data for email and tutors log.

The following research questions were put forth to about 200 people:

1. Features.
2. Keeping track of grades on assignments and tests online
3. Online access to sample exams and quizzes for learning purposes.
4. Online syllabus
5. Turning in assignments online
6. Online readings and links to other text based materials.
7. Taking quizzes and exams online.
8. Getting assignments back online with instructor comments and grades.
9. Online sharing of materials among students.
10. Online discussions.

4. Reference period of the data to be covered

Already Collected. Few Faculty & students said that they had previous experience taking a fully online course (78.6%) and students were mixed as to whether they plan on taking an online course in the future, with 52.9% saying yes and 47.1% responding no.

5. Method of Processing and Analysing

The technique for data analysis, for the journey between raw data and analyzed data, was one that was applied to all the data sets collected for this, and other studies, and comprised the following steps:

1. All raw data was typed up
For example discussion board and email messages.
2. Each data set is then examined individually for similarities or differences within the responses, or for themes emerging from the data.
3. Once this had been completed for the individual data sets, a table is drawn up that comprised all data sets so as to examine any inter data set themes.

The implementation of a comprehensive measurement and evaluation system will require five key elements:

- Different types of collected data can be classified into five levels (the first four were developed by Kirkpatrick in the 1950s)
- Measure **participant reaction** with the program and capture planned actions during the actual learning activity.
- Measure change in **knowledge skills or attitude**.
- Measure change in **on-the-job behavior** and specific application actions.

- Measure changes in **business impact** for either individuals or work units.
- Compare the **monetary benefits** of the program to the actual cost of the program

The main Purpose for Assessing and Measuring an e-Learning application are

- to determine whether the e-learning course has accomplished its objectives
- to identify the strengths and weaknesses in the e-learning process
- to identify who benefited the most or the least from the course
- to collect data to assist in developing future applications
- to determine the benefit/cost ratio of the e-learning course Other demands for evaluation
- The newness of e-learning to many groups brings pressure to develop information about its effectiveness and efficiency as a learning solution.
- Because e-learning is not a proven process, there is a need to show value now rather than later when it becomes a routine process.

The suggested ways to evaluate e-learning are

- The types of data are the same, both quantitative and qualitative.
 - The levels of evaluation are the same (five levels of evaluation).
 - The data collection methods are the same for each of the levels of evaluation.
 - The methods to isolate the effects of e-learning are the same.
 - The methods of converting data to monetary values are the same.
 - The methods of analyzing and reporting data are the same.
- Several issues are different with e-learning:
 - o The methods for collecting data for Level 1 (reaction), and Level 2 (learning) can be built into the process much more easily than traditional methods.

Expected Benefits

It is intended to enrich and complete the traditional face-to-face teaching and learning in control with highly interactive, self-learning tools, including hypertext, exercise bases, simulations, and virtual and remote laboratories. It also seen as a substitution for traditional face-to face teaching and learning, providing open distance learning in the context of continuing education. Successful e-Learning students share certain qualities and abilities. They are

- **E-Learning requires motivation and self-discipline.** Successful e-Learning students are able to study independently and incorporate study time into their busy lives. Students should set aside regular study time. e-Learning requires a real commitment to keep up with the flow of the process and to finish within the required period of time.

- **Define your goals and plan for success.** Define your goals and objectives for your e-Learning experience. Understand the requirements and plan ahead so that you will know what's expected of you and how your performance will be evaluated.
- **e-Learning requires good reading and writing skills.** The ability to efficiently read and interpret instructions is a critical skill in e-Learning. Most activities and communications are also written, so it is important to be comfortable with your ability to express yourself through writing.
- **Incorporate work, life, and other educational experiences as part of the learning process.** e-Learning requires the student to make inferences based on experience as well as facts. Meaningful reflection and critical analysis of information are an essential part of the learning process. Look for opportunities to apply what you have learned in your life.
- **Be willing and able to commit adequate time to the e-Learning process.** e-Learning is a convenient way to receive education and training, but it is not easier than the traditional educational process. In fact, it often requires more time and commitment.
- **Have access to the necessary equipment and create some personal space.** It is important that you have a place to study in a peaceful and focused manner.

To be a successful e-Learner you must believe that meaningful, high quality learning can take place without a traditional classroom. When properly designed and executed, e-Learning is a highly effective and rewarding learning environment.

5. Conclusion and Future Work

We proposed a general formulation of interesting model for e-learning. This can help instructors to design courses more effectively, detect anomalies, inspire and direct further research, and help students use resources more efficiently. Additionally, quantitative and qualitative data will be collected to evaluate the outcome and effectiveness of the online courses. Quantitative data will include the pre- and post-course surveys developed by researchers and professionals. Qualitative data will be collected through focus groups with participants of the online courses. Our long term objective is to create a full featured learning system targeted for academic environment.

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