

# E-learning Concept Trends

Manuela Aparicio  
Instituto Universitario de Lisboa  
ISCTE-IUL, Adetti-IUL  
ISEGI, Universidade Nova de  
Lisboa  
IADE/ UNIDCOM  
Lisboa, Portugal  
[manuela.aparicio@acm.org](mailto:manuela.aparicio@acm.org)

Fernando Bacao

ISEGI, Universidade Nova de  
Lisboa  
Lisboa, Portugal

[bacao@isegi.unl.pt](mailto:bacao@isegi.unl.pt)

## ABSTRACT

E-learning systems are widely used from academia to industry. The usage of e-learning systems raises new research contexts. Multiple collaborative learning systems were implemented to improve people interaction, communication, working, coordinating activities, socializing and learning. E-learning systems play an significant role in the learning activities. This paper presents a critical literature review on e-learning systems; it is composed by two main parts. The first part contains a literature review on the e-learning concept and evolution. The second part consists on the concept different perspectives overlaps' according to the various e-learning dimensions.

## Categories and Subject Descriptors

K. [Computing Milieux], K.3. [Computers and Education],

K.3.1. [Computer Uses in Education].

## General Terms

Design, Documentation, Human Factors, Theory.

## Keywords

E-learning, online learning, distance learning.

## 1. INTRODUCTION

Communication between student and teachers is no longer based in one way communication but usually a two way communication. Students interact with teachers, asking for tutoring services and questions on topics, as well as students also communicate with their peers. Students have access to technological media that enable them to participate in several groups of knowledge, as well as, they have the possibility of creating content to spread their own knowledge, as fast as a click. University students typically engage in groups in order to learn and develop work together.

E-learning industry increased significantly in terms of usage, in participation gathering new markets and designing new business models for universities and other organizations. Learning is part of people life whether they are fulltime students or professional people, which uses e-learning platforms for life-long education in organizational contexts. Learning markets are increasing throughout the world [34], as for the online learning courses and according to the Eurostat the percentage of individuals that used the Internet for doing an online course is increasing every year and is about 7% of the European population in the 27 European Union (EU) countries [13].

Through literature it can be identified the overlapping characteristics of on-line learning systems and e-learning systems. The literature review discusses the evolution of the e-learning concept, in order to find differences between those concepts. Differences in the focus of the e-learning concept may be found as a result of the different authors' perspectives or as result of time evolution.

In this context, this paper presents a literature review on the e-learning concept evolution.

## 2. E-LEARNING CONCEPT EVOLUTION

E-learning system is a concept in evolution. E-learning systems have their roots in the concept of Computer-Assisted Instruction (CAI) [44]. According to Zinn [44] a CAI "refers to the use of computers to present drills, practice exercises, and tutorial sequences to the student, and perhaps to engage the student in a dialogue about the substance of the instruction." The concept of computer-assisted instruction appeared for the first time in 1955 as a result of the way of teaching problem solving [44]. Some definitions of computer-assisted learning and teaching have their focus on contents, other are focused on communication or even on technology [29], as shown in table1.

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**Table 1. Table captions should be placed above the table**

Acronym	Description	Concept Focus	Authors
CAI	Computer-Assisted Instruction	Institutional driven, use of the computer to facilitate and test learning.	J. Kemeny & T. Kurtz,[22] T. Anderson
ALE	Artificial Learning Environments	Use of an artifact as a mediator in learning	M. Fiol & M. Lyles [14]
CAL	Computer-Assisted Learning	Focused on individuals rather than tasks.	R. Hart [18] M. Levy [25]
REAL	Rich Environments for Active Learning	Student responsibility and initiative. Generative learning activities. Authentic learning contexts. Authentic assessment strategies. Co-operative support	R. Grabinger & J. Dunlap [17]
CFL	Computer-Facilitated Learning	Emulates teacher-driven learning episodes, contrasts with the constructivist approach. Environments is to group applications into functionally similar categories and highlight the learning processes and outcomes which are likely to be ‘afforded’ by each category	J. Bain et al. [3]
SRE	Self-Regulatory Efficacy	Learner’s independent assessment of self-regulatory learning ability	M. Bong [6]
CAE	Computer-Assisted Education	Computer uses Materials Production Students` use of the computer	K. Zinn [44]
CBE	Computer-Based Education	Variety of computer uses	K. Zinn [44]
CMI	Computer-Managed Instruction	Focused on teacher tasks	K. Zinn [44]
e-Learning	Electronic Learning	Use of a Web System that makes information available, disregarding time and space.	M. Rosenberg [35]
LMS	Learning Management Systems	Registration, tracking and deliver content to learners Reports learner progress, assessment results and skill gaps for instructors.; “Includes learning contents and teacher interactions”	J. Ismail [19] J. Lee & W. Lee [23]
LCMS	Learning Content Management Systems	Content Management launch pads for third party content that the organization would purchase or outsource	J. Ismail [19]
SDL	Self-Directed Learning	Focus on the teaching–learning method. “Learner attends lectures only to register time, place, subject, and to alter the order of attending lectures”; “the core of learning is the students and every service offered by e-Learning”	A. Rovai [36] J. Lee & W. Lee [23]
ILM	Internet-based learning medium	“Primary goals of using an ILM is to support and improve student learning.”	M. Lee et al [24]
CSCL	Computer Support for Collaborative Learning	Computers facilitate, augment and redefine support learning in groups.	G. Sthal et al [38] S. Ludvigsen & A. Mørch [27], A. Mørch [33]
MOOC	Massive Open Online Course	Free diffusion of content courses to a global usage through the Web. Integrates the connectivity of social networking, the Facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources.	A. McAuley, et al. [30] R. Godwin-Jones [16]

Analyzing the concepts in a chronological perspective it can be concluded that e-learning as a concept was not the first name to the use for a computerized system that enables or facilitates the learning process. In the first years, this concept was focused in tasks accomplishment and subsequently more focused to the students. Another concept related to e-learning is the concept of online learning. Online learning can be defined as learning that takes place partially or entirely over the internet that makes information or knowledge available to users disregarding time restrictions or geographic proximity [39]. However, e-learning systems have also included the technological and functional driven focus, regarding the Internet possibilities in overcoming some time and space issues. The concept trend is nowadays more focused on the learning methods and the massive possibilities of content diffusion and connection.

### 3. E-LEARNING DIMENSIONS EVOLUTION

E-Learning theory is composed by three components, according to Dabbagh [10] e-learning can be defined through a theory-based framework, which relates “learning technologies”, “Instructional strategies” and “Pedagogical models or constructs”.

These three components arrange various relationships in which e-learning pedagogical design models are grounded. Dabbagh’s framework [10] integrates multiple dimensions, such as the way people learn (open/flexible way), with the learning strategy (collaboration, exploration, problem solving) and also with technology. The three-component framework, (Figure 1), implies an interaction that affects e-learning environment. “Pedagogical models are cognitive models or theoretical constructs derived from knowledge acquisition models or views about cognition and knowledge, which form the basis for learning theory. In other words, they are the mechanism by which we link theory to practice”[31]. Instructional strategies are what instructors or e-learning systems use facilitating learning, such as, collaboration, articulation, reflection, role-playing, exploration, among others.

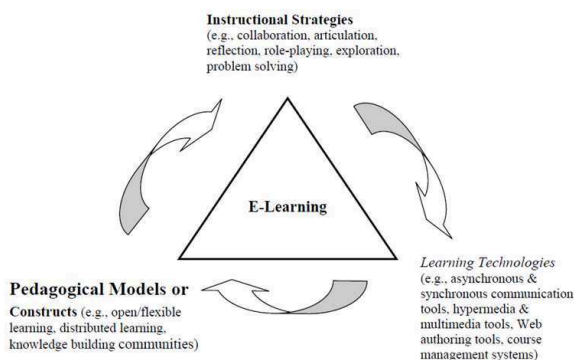


Figure 1. Theory-based Framework [10]

Although pedagogical models are important to modularize instructional strategies, this is not the subject of this thesis. E-Learning systems evaluation is the specific subject field of this research. In this study and according to the objectives definition is intended to understand why people use e-learning systems and evaluate the satisfaction level and potential benefits of using this kind of systems.

As a result of the table 1, which depicted the evolutionary conceptualization of the context of the e-learning systems, object of the research, it was constructed another table (table 2) in which those concepts were classified according to two ways of e-learning typifying dimensions:

1. Dabbagh Theory Based Framework [10]
  - a. Pedagogical models driven
  - b. Instructional strategies driven
  - c. Learning technologies driven
2. E-learning Perspectives Mason & Rennie [29]
  - a. Content driven
  - b. Communication driven
  - c. Technology driven

Table 2. E-learning Concept Perspectives Overlapping

Year	Acronym	Pedagogical Models	Instructional Strategies	Learning Technologies	Content	Communication	Technology
		Dabbagh Theoretical Framework,[10]			Mason & Rennie, e-learning Perspectives [29]		
1968	CAI			X			X
1985	ALE			X			X
1981	CAL		X			X	
1995	REAL	X	X		X	X	
1998	CFL	X		X	X		X
1998	SRE	X	X			X	
2000	CAE			X	X		
2000	CBE			X			X
2000	CMI	X				X	
2001	e-learning	X	X	X	X	X	X
2001	LMS			X	X	X	X
2001	LCMS		X	X	X		X
2004	SDL	X				X	
2004	ILM		X		X		
2006	CSCL	X	X	X	X	X	X
2010	MOOC	X			X	X	

From the classification two key concepts emerged: e-learning and computer support for collaborative learning (CSCL). These two concepts grouped all the classification focus, as seen in table 2, those were the concepts that addressed the theoretical framework dimensions’ and the e-learning perspectives. The classifications of the e-learning concepts are used for better understanding the overlaps between them and to identify possible differences.

The e-learning concept was defined by Marc Rosenberg [35] cited by Mason & Rennie [29]”confines e-learning to the internet as the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance. It is based upon three fundamental criteria: networked delivered to the end-user via a computer using standard internet technology focuses on the broadest view of learning”. Later this author [35] redefined the concept as “e-learning is the use of internet technologies to create and deliver a rich learning environment that includes a board array of which is to enhance individual and organizational performance”.

From the table 2, another term including all the classification characteristics is CSCL this concept is defined by Ludvigsen & Mørch [27], “Computer-Supported Collaborative Learning (CSCL) is the field concerned with how Information and

Communication Technology (ICT) might support learning in groups (collocated and distributed). It is also about understanding the actions and activities mediated by ICT.” Collaborative learning systems derive from the intersection of collaborative systems and e-learning systems. E-learning systems concept is related to the activity of learning through a computer system. “As an activity, learning entails working. It also transcends working. The purpose of learning is not the production of something that remains as a separate object when the learning person leaves the scene, but it is rather the production of something that goes with the learning person: As an internal state has changed, a subjective product has been created, tied to the learning person.” [15]. This understanding of collaborative learning differs from the previous authors defined as CSCL [27]. According to these researchers, CSCL is defined essentially as a group or a group of social activities mediated by the use of technologies to gain knowledge. Apart from this perspective, e-learning enhances not only the study of students’ interaction; contents and technology, but also students’ motivation to use systems and also the motivation in collaborating with peers. Liu et al [26] found that the design of an e-learning course had a great impact on the students perceived usefulness, perceived usefulness and also in the perceived interaction. “Collaborative learning is a type of learning, that emphasizes interactive social processes”[1]. Berge [4] proposed that online courses should also consider the interaction between students and teachers. In the learning process, collaboration plays an important role [39]. The US Department of Education [42] analyzed more than a thousand empirical studies and published the meta-analysis results study. The results demonstrated various contrasts between online and face to face learning. In this meta-analysis the students’ outcomes were also measured. The study was performed under rigorous research design, based in scientific research of 176 studies, since 2005. The study findings revealed positive effects associated with blended learning course design. The meta-study found that online learning grew 65% only in three scholar years, from 2002/2003 to 2004/2005 [42]. The findings also concluded that online learning partially overlaps with the concept of distance learning. To the study, the following technologies were considered as online learning: web resources, web based applications and new collaboration technologies. As main results, it was found that using online learning systems use brought benefits. Those results are:

- Online Students performed better than those on face-to-face instruction [43];
- Blended Instruction (online and face to face) has a larger advantage relative to purely offline and online per se, and the positive effects associated with blending learning are not merely attributed to media per se [43];
- Students performed better online than those offline with the same resources (it may lead to an idea that the good results can be derived from the online learning conditions, rather than the instructional delivery medium) [5];
- Combining online and face-to-face learning modes brought larger advantages for the learning outcomes, even when compared with face-to-face mode [43];
- On-line learning reveals to be more beneficial to some types of students, such as undergraduates, graduates and professional students [7];
- Collaboration or instruction-directed in online learning had positive impacts on learners that worked independently [8];

- On-line learning variations of the modules did not affect student learning outcomes significantly [7], [32];

- There are some findings which show that the way students use media is far more important to their results, than having access to different media [37];

- There are differences on the effectiveness of online Learning regarding different learner types [8];

- Significant positive effects have been found in collaborative and instructor-directed lessons, compared to independent or active online learning [28].

Collaborative learning systems adoption and usage is an valuable research field, not only because of the technological development in the last decade that enabled the spread and diffusion of those systems, but also because it is necessary to understand what leads people to the continuous usage of e-learning systems. According to a study there has been an increase in 65% of online courses [42]. Open courses the growth of enrolments are substantial [40], [2]. On-Line is changing roles partial support to main media of lecturing reaching students from other countries and realities [9]. As time went by, on-line platforms, such as Blackboard, Moodle, Edmodo, Sakai, among others [11] have been used as a tool that enables, not only information structuring, but also a communication channel between the course users among them and between students and teachers. This communication allows the student-lecturer interaction and the student to student communication. E-learning systems are referred to as a type of collaborative system [38]. It is intended to assess the users’ satisfaction level with the o-line learning systems.

Due to the diffusion of online learning through various formats from closed ones to open learning it has been verified a massification of open online courses (MOOC’s), this fact is a controversial issue, because MOOCs lead to a different reality of learning. The authors Allison et al. [2] stated that MOOCs are disrupting learning environment due to the global and free adoption and use of these open courses. Although according to a study made by Jordan [21], students or any public user are enrolling massively to various courses by thousands of students, for example one of the largest (by the number of enrolled students) has 180K and one of the smallest has 20K students. These figures demonstrate that a course in any university never reaches these numbers of students at the same time not even a teacher reaches in his own career this quantity of students enrolled. In the referred study, Jordan [21] also compares the enrolment rates with the completion rates per each course, and for all of them these completion rates are extremely low. In this context, it is necessary to understand in what extent students are derived to enroll in MOOCs but never take the first exams to assess their acquired knowledge.

McAuley et al [30] defines massive online open courses as “An online phenomenon gathering momentum over the past few years, a MOOC integrates the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources.”

This fact stresses the importance of the study because it disrupts e-learning methodologies and universities business models.

## 4. CONCLUSIONS

In this paper, it was made a literature review to clarify the e-learning concept. The e-learning concept evolution was presented and we can conclude that this concept is still changing. From the first perspectives were e-learning focused more on technology rather than in students, nowadays we can verify that e-learning goes in the direction of students' collaboration, directed learning between student and teacher. But as a parallel reality, e-learning can also mean, massive distribution of content and global classes for all the Internet users.

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