

# Do eLearning Technologies Improve the Higher Education Teaching and Learning Experience?

Shabtai Itamar<sup>1</sup>, Ph.D; Bregman David<sup>2</sup>, Ph.D; Dac Israel<sup>3</sup>; Korman Arik<sup>4</sup>

The College of Management Academic Studies

Israel

dudibreg@colman.ac.il

itamar@colman.ac.il

<sup>1</sup>Academic Director, Advancement of Teaching Center

<sup>2</sup>Coordinator, Business Simulation, School of Business Administration

<sup>3</sup>CIO, The College of Management – Academic Studies

<sup>4</sup>CTO, Advancement of Teaching Center

## **Abstract**

*As the scope of information and communication technology (ICT) rapidly increases and expands, its benefits form reliance in higher education upon related eLearning technologies. By integrating sophisticated computer software and networked technologies, eLearning provides academic institutions with a way of enhancing and enriching teaching performance of faculty and learning activities of students.*

*The expanding use of eLearning technologies over the last two decades is illustrated using the three Web generations. A model for mapping and assessing the various dimensions of eLearning-technologies is proposed. Case studies of courses, based on various eLearning methods, are analyzed and assessed by referring to the model dimensions. Findings of empirical research studies and surveys comparing different teaching methods, demonstrates the impact of adopting eLearning technologies on the teaching and learning experience.*

*Adopting and applying these new eLearning methods and techniques generate a role-*

*transition, turning lecturers from knowledge-providers into mentors. Enriching the curricula with eLearning-based courses improves efficiency, without reducing academic effectiveness.*

**Keywords:** eLearning Technologies, Higher Education, Teaching and Learning Experience

## **Introduction**

As the scope of information and communication technology (ICT) rapidly increases and expands, its benefits are creating reliance in higher education upon related eLearning technologies. We face a dramatic gain in available bandwidth on one hand, and a constant drop in costs of networking, communications, wireless and mobile technologies, on the other hand. Integrating sophisticated computer software and networked technologies, eLearning provides academic institutions with a way of enhancing and enriching the teaching performance of faculty and the learning activities of students, both pedagogically and economically.

Over the last three decades, we have witnessed dramatic changes in higher education teaching aids. eLearning has evolved from the traditional face-to-face (F2F) method, enhancing the distant teaching and learning concept. Traditional teaching aids such as blackboards are gradually being replaced by technology-intensive aids, such as digital presentation displays, smartboards, etc. Teaching-support applications, such as bulletin-boards, content management and integrated communication tools, as well as web-based learning content management systems, address a broad range of needs of educational institutions, allowing for set up and maintenance of central learning hubs. Synchronous and asynchronous eLearning are the two major approaches currently used for distance learning. Synchronous eLearning sessions take place in a virtual classroom, assisted by various technological and communication aids. The teacher and the students take part in a class and interact throughout the session. Asynchronous eLearning abolishes the time and place boundaries, by providing students with online course materials and asynchronous communication aids, such as web forums and digital bulletin-boards. Both synchronous and asynchronous methods require teachers to acquire new capabilities and skills, in addition to the traditional ones. eLearning methodologies and technologies are classified and analyzed using the "eLearning Dimensions Mapping Model" (Figure 1).

## 2. "eLearning Dimensions Mapping Model"

The interdisciplinary nature of eLearning is characterized by a broad, rich and complex set of patterns. Our model was defined and designed in order to systematize and sort out the various eLearning techniques used in higher education. The three-dimensional approach is visualized using three orthogonal vectors, representing three eLearning-related aspects: Teaching methodology, Communication and Content-delivery. In order to evaluate the impact and contribution of eLearning technologies on the higher education teaching and learning experience, a comprehensive case-study analysis of different courses, taught at the College of Management, was conducted. The model is used for mapping combinations of technology, teaching methods, and communication forms of the courses.

### 2.1 Teaching method (rate of technology usage)

Bringing technology into play as part of the academic teaching process is hereby discussed, focusing on three levels of intensity.

The *F2F* method refers to traditional teaching in class, where technology usage as part of teaching is inconsequential, mostly used as a teaching aid in class. F2F teaching doesn't require any particular technological skills or technology-intensive devices and infrastructure.

The *synchronous eLearning* method abolishes the spatial boundaries, creating a virtual "classroom", as a replacement for the tangible classroom, thus requiring advanced technologies to create an effective meeting point for students and teachers, where content is delivered without impairing the learning experience.

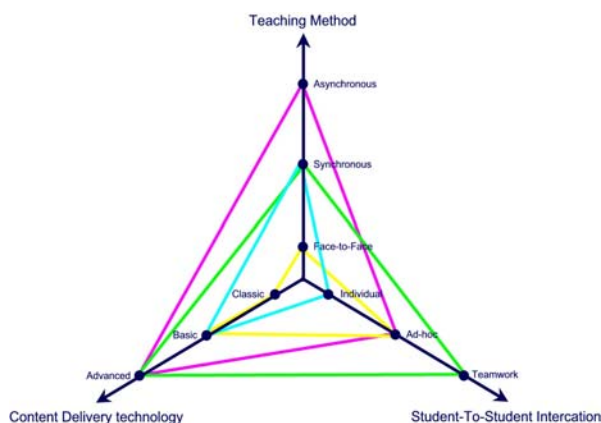


Figure 1: eLearning Dimension Mapping Model

Asynchronous methods essentially break the teacher-student online communication, thereby significantly affecting the learning experience. In order to compensate for this need, intensive technology is used, allowing students an easier access to the course materials, exercises, essay guidelines, etc. Content management applications and rich hyperlinked documents enhance the learning experience, and provide students with easy access to websites, articles, rich multimedia, and presentation materials.

Teachers may choose more than one method and create hybrid classes; for example, traditional F2F teaching, accompanied by a "virtual class", utilizing the beneficial advantages of technology, without renouncing the advantages of frontal teaching in class.

**2.2 Content delivery**

Teaching and learning experience may be enriched by leveraging content delivery using advanced technology. Dedicated applications, such as Learning Content Management System (LCMS), provide a comprehensive set of solutions for managing and delivering course materials as well as forms of communication [1]. Course materials are enriched by adding multimedia, virtual worlds, simulation tools and simulators, either in class or anywhere else. Highly intensive usage of technology is environmentally-independent, and thus may be used for traditional frontal teaching in class, as well as in distant learning methodologies. Being exposed to the LCMS's benefits, students' demands increase, thus empowering the usage rate and gradually turning the LCMS into an essential element of the academic teaching and learning experience.

**2.3 Student-to-student interaction**

Increasing the level of interaction between students is a motivating factor for students,

and teams' achievements are most likely to be higher than those achieved by individual work. Yet, obtaining high performance and outputs requires synergetic mutuality among team members. Technological tools, such as instant messaging, forums and chats, allow students to share each member's unique capabilities and knowledge, bringing the synergetic effect to life.

**2.4 Examples – Model dimensions mapping**

Table 1 illustrates three course examples, according to the three dimensions mapped in the model.

**Table 1: Mapping examples**

Model-Dimensions Mapping				
#	Course Name	Teaching Method	Content Delivery Technology	Student-to-Student Interaction
1	Issues in Marketing Management.	Asynchronous	Advanced	Ad-Hoc
2	Business Simulation (Virtual)	Synchronous	Advanced	Teamwork
3	Business Simulation (Classic)	Asynchronous + F2F	Moderate	Teamwork

**“Issues in Marketing Management” course.**

This example illustrates an elective course, comprised of an integration of the interdisciplinary fields of marketing, acquired in previous marketing courses. The learning process consists of both professional and academic materials, such as articles, movies and video, websites, presentations, etc. The teaching process involves asynchronous remote tutoring, as well as feedback on the theoretical and practical aspects of the essays. In order to overcome the absence of a tutor, tutoring techniques

are designed using online, interactive learning guides, references, hyperlinked essay guidelines, etc.

Communication and interaction between the tutor and students is based purely on asynchronous aids like discussion groups, forums, and email.

**“Business Game” (virtual) course.**

“Business Game” (Bizgame) is an interdisciplinary course, obligatory for all undergraduate students learning at the school of Business Administration and the Department of Economics in the final year of studies. Decision-making processes and teamwork are inherent by simulating an executive management of a commercial firm [2]. Intensive use of technology and synchronous eLearning applications allow students who live far away from each other to form teams, record sessions, and benefit from flexible schedules and office-hours.

**“Business Game” (classic) course.**

The same course described above is suggested to students using a different teaching method. The classic course uses a hybrid form of teaching and learning: All plenary sessions and consultation meetings are held F2F, on-campus. Students may choose their internal-team meeting form, and have full access to the course materials and technologies.

**3. eLearning enabling technologies - current and future trends**

Rapid developments over the last two decades, together with the evolvement of the Internet, has produced what we now refer to as “Web-based eLearning”. The three major Internet generations – WEB 1.0, WEB 2.0 and WEB 3D, have significantly affected eLearning. In addition, mobile technologies have been widely adopted.

**WEB 1.0** - The World Wide Web first generation, introduced in 1991, was the first step towards changing the way we live. It is characterized by a convergence of new computerized and networked technologies. These new technologies, especially hypermedia and multimedia, have provided us with the ability to organize, present and illustrate content in various new groundbreaking ways. Browsers' multimedia-support enables presentation of data and information, combining texts, graphics, audio, video and animation. Hypertext and hypermedia enable us to organize, store and explore user-driven content, using intuitive, associative and simple interfaces. In addition, WEB 1.0 eliminates time and place limitations and constraints, providing users with synchronized and a-synchronized forms of interaction, thus enhancing the teaching and learning experience.

**WEB 2.0** – The WWW second generation was introduced in 2004. Unlike the centralized manner of the previous generation of the Internet, WEB 2.0 belongs to the individual, as well as to the masses. Its main concept is moving towards decentralization: rather than knowledge being created by institutions, it is now created by the masses. Mass interaction replaces mass communication. The most popular example of this concept is WIKI. Others are blogs, podcasts and vodcasts (YouTube), social networks, etc. Adopting the Web 2.0 concepts transforms the teacher's role from a lecturer to that of a mentor. As a result, additional teaching skills and capabilities - such as leadership and tutoring - are required.

**WEB 3D** – The WWW third generation has recently evolved, introducing 3D virtual worlds for eLearning. These worlds provide the ability to build and simulate virtual activities, illustrating and demonstrating realistic environments, such as business-

marketplace, operating theaters, and production lines. The utilization of virtual worlds enables interdisciplinary knowledge pooling and assimilation. *Second Life* is the most popular application of Web3D, used by many educational institutions for creating teaching and learning environments [3], or other resources discussing the diverse benefits of various forms of illustration.

**Mobile** – Mobile technologies enable us to be remotely active, anywhere and anytime. Mobile devices are constantly used by almost everyone, allowing communication even in the most rural areas. Various mobile devices are also available: PDAs, cellular phones, audio and video players. The use of mobile technologies in higher education enriches the teaching and learning experience. Students can remotely participate in the on-line course, as well as remotely access course materials such as lesson-recordings.

**4. Evaluation of eLearning methodologies and techniques**

Following are some findings of research studies and surveys, conducted at the College of Management during the last five years, comparing different teaching methods, and evaluating achievements, perceptions and attitudes of both students and teachers regarding usage, performance and academic benefits and challenges.

**Learning Content Management System**

Significant benefits have emerged from adopting the Academic-Portal [1] as a central content delivery tool, during the last 4 years:

- Increased efficiency (both financial and operational) and academic effectiveness
- Improved communications
- Virtual learning environments
- Knowledge sharing

All of the above serve to contribute to the teaching and learning experience, bringing

innovation and revitalization to the curricula and the course materials.

The Academic-Portal survey, conducted in 2006 among 112 academic staff members, assessed usage parameters, as well as teachers' opinions. Following Table 2 focuses on some perceptions related to the eLearning Dimensions model:

**Table 2: The Academic Portal Survey**

Teachers' opinion on improving/increasing:	"Positive" attitude Percentage
Ease of accessibility to students and academic staff	65%
Learning interactions	36%
Quality of teaching	30%
Organizing course contents and structure	60%
Students' satisfaction	72%

**Synchronous eLearning**

Synchronized eLearning-based courses have been conducted at the College of Management for more than five years [4]. Feedback from both students and academic staff members alike indicates that they accept eLearning and sometimes even prefer it to traditional learning. Students and teachers' opinions on synchronized eLearning-based courses were examined using midterm and end-term questionnaires, addressing the subjects of acquired knowledge, efficiency, effectiveness, attendance and intellectual challenge. All teachers and assistants were satisfied with the system, its ease of use, and the provided technical support. Sixty-seven percent (67%) of the students found eLearning courses to be as efficient as traditional courses. When asked whether they would take additional synchronized eLearning-based courses, 45% of the students chose "Definitely", while 25% chose "Yes".

One may argue that there is no substitute for maintaining constant eye-contact between lecturers and their students, in order to get a sense of the students' assimilation of the course contents in class. However, empirical findings of research studies conducted at the College of Management have shown that students' achievements were slightly, insignificantly higher in favor of synchronized eLearning, as illustrated in Table 3.

The second research study examined the "Business Game" course. This course has been offered to students in either F2F or distant (synchronized) format. The study's main purpose was to compare the impact of synchronized eLearning vs. traditional learning on students' achievements. This study began three years ago, and is repeated every year. Since 2006, the research scope integrated the questionnaires and scores of 1,200 students; some 100 of whom participated in the synchronized course.

**Table 3: Students achievements - Synchronous vs. F2F methods**

Average Grade Teaching Method	Score	Exam	Final
F2F	80.88	85.23	84.61
Synchronized	81.68	87.02	84.93
All students	80.94	85.36	84.63

**Asynchronous eLearning**

The third empiric study we conducted dealt with students' attitudes towards asynchronous eLearning. The "Selected Issues in Marketing" course, described in Chapter 2 above, is based on asynchronous eLearning. Attitudes and perceptions were examined using an online, structured 1-7 scaled feedback form, filled in by 44 students who took the course. Findings are presented in Table 4.

**Table 4: Asynchronous course feedback**

To what extent are you satisfied with:	% answered 6 or 7 (Very or Extremely Satisfied)
the effectiveness of the course's Website in the Academic portal?	84
the new perspectives driven by the course?	80
the course's contribution over F2F courses?	79
the asynchronous method?	77
Would you take more asynchronous courses in the future?	80

**5. Conclusions**

Applying technology-based methods requires lecturers to acquire adequate skills and capabilities. Adopting and applying these new eLearning methods and techniques generates a role-transition, turning lecturers from knowledge-providers into mentors. Empirical studies have shown the noteworthy ICT's contribution to the teaching and learning experience, by enhancing different eLearning methods without adversely affecting the experience, and in some cases even enriching it. Enriching the curricula with eLearning-based courses improves efficiency, without reducing academic effectiveness.

**References:**

[1] Bregman D, Shabtai I, Dac I, Keinan G, Korman A, "An Academic Learning Portal: Implementation and Usage", International

Journal of the Computer, the Internet and Management, Vol. 15, SP3, 2007.

[2] Bregman D, Keinan G and Korman A, Shabtai I, "*Business Game - An Illustration of Intensive Web Based eLearning Support Technologies Usage*", International Journal of the Computer, the Internet and Management, Vol. 14, SP1, 2006.

[3] Sivan Y, "Your Next World: Second Life as an introduction to the Metaverse",

[4] Bregman D, Raanan Y and Amitai Y, "*Synchronic Distance Learning: A Brief Review and Implications*", International Journal of the Computer, the Internet and Management Vol. 14, SP1, 2006.